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ABSTRACT

The use of television as a component of instructional programs designed for home-based students was studied. Three on-going programs--Chicago's "TV College;" Bavaria's "Telekolleg", and a Children's Television Workshop series, "Sesame Street"--were chosen for examination. The planning and development stages of these three projects are discussed, pointing out the procedures, activities, and elements of each that appear particularly significant to its success. A checklist of items necessary in the development of a new instructional program using television classifies under four phases those components necessary for success. A general model is described that synthesizes the successful components in the preplanning, planning, promotion, production, operations, and evaluation stages, and gives a comparison of costs. (JY)

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Three Models for Home-Based Instructional Systems Using Television

Rudy Bretz

A Report prepared with Financial Support from
THE UNITED STATES OFFICE OF EDUCATION
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Rand
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PREFACE

This is the final report of a brief study performed at the request of the Division of Research and Development Resources of the U.S. Office of Education (USOE). It is based on a survey conducted in New York, Chicago, and Munich during July 1971.

The USOE was considering whether to invest in another nationwide television series to follow their successful first investment, *Sesame Street*. They asked Rand to study current instructional projects using home-based television and to analyze key elements contributing to their success. The study was to present models for the development of a new television instructional program on career education aimed at women in the home.

A Rand team, Rudy Bretz, Marjorie Rapp, and Daniel Weiler, was assembled under the leadership of John Pincus. Each of these four persons visited at least one site during the study period. They prepared and forwarded the results of their investigation as rapidly as possible to the Office of Education. The present report, written by a member of the original team, emerges from the review and revision of that study with the three-fold advantage of the perspective of a year's time, funds from the Markle Foundation to support the rewriting, and the help of an excellent review by Nathaniel Feldman. This report presents summary case studies of three separate TV-educational programs and a general program model. It should be useful in planning instructional television projects.

SUMMARY

This report investigates the use of television as a component of instructional programs designed for home-based students. It selects for detailed examination three ongoing programs: Chicago's *TV College,* Bavaria's *Telekolleg,* and a Children's Television Workshop (CTW) series, *Sesame Street.* The first two are credit-course programs on the junior college and secondary levels, respectively, leading to degrees or certificates, and hence may be directly compared. The third, *Sesame Street,* is basically an entertainment series for children, with a strong instructional emphasis. It is frequently compared with other instructional television program series and cited as an example of what all educational TV could and should be. But because it is very different from direct instruction in approach, in resources, and in scale of utilization, *Sesame Street* is better contrasted than compared with the other two programs studied.

The purpose of this report is to analyze the planning and development stages of these three projects, pointing out the procedures, activities, and elements of each that appear particularly significant to its success. This approach is chosen to put information on the history of these and similar projects into a better perspective, and to be of help to prospective planners who are contemplating the design and implementation of instructional projects using television transmitted to the home.

The report includes a checklist of items necessary in the development of a new instructional program using television, classifying under four phases of program advancement those components necessary for success.

The three case-study programs varied widely in their approach to television instruction, yet all were successful in reaching a target audience, in satisfying an educational need, and in satisfying the sponsoring agencies who are continuing to support them. All three required similar activities in the preplanning, planning, and production stages of development but techniques and emphases differed.

There were substantial differences in the style and complexity of production techniques used in the three model programs. Chicago's *TV College* and *Telekolleg* relied heavily on instructional components other than television: supplementary printed materials, student seminars, communications between faculty and students, and examinations. Few nontelevision elements were used in the informal instruc-

tion of *Sesame Street*. Those printed materials that were prepared were primarily for teacher and parent use, or were promotional in nature.

Adequate preplanning was important to the success of each project. Planners needed to analyze characteristics of the target audience in each case, and to gear instruction to that audience's specific educational needs. A rough cost analysis revealed a wide difference in cost per viewer, ranging from *Sesame Street's* lowest cost for each distributed program of $0.004 per viewer, to *TV College's* cost (per credit student) of $3.75—a ratio of almost 1:1000. Obviously, formal instructive viewing and informal, generally educational viewing are two quite different uses of television. In the case of the two credit-course projects, a cost comparison can be made between the cost per TV-credit student and the cost per in-school credit student enrolled in the same subjects. In Chicago's City College system, the current estimate of the cost for an average student is $50 per credit hour; the cost to educate the same student through the *TV College* is $42 per credit hour, or 84 percent of the cost of conventional education. *Telekolleg* estimates that it costs only 20 percent as much to educate a *Telekolleg* student as a student in the conventional schools that teach the same curriculum.

The success of *TV College* instruction seems due partly to the greater effort that goes into the preparation of the instruction and partly to the higher motivation of the off-campus students. Supplementary materials in other media are an important part of the TV credit courses. *TV College* professors, for example, are relieved of other active teaching duties for an entire semester, during which they prepare 30 TV lessons and an extensive Teleclass Study Guide. *Telekolleg* students are given even more extensive printed study materials that are coordinated with the television programs and prepared by the same writer-editor teams.

A very important element to the success of each of these projects is the effort directed toward reaching the target audience with promotional information and personal contact. This is important not only for maximum program effectiveness, but for the constant feedback from users which can result in continued improvement of the service. The evaluative feedback gained from survey information on *Telekolleg* allowed its planners to meet the educational needs of a target audience that turned out to be somewhat different than expected. *Sesame Street* budgeted funds to produce five pilot programs shown to sample viewers. Even though it is a nationwide series with a total audience of some 8 million preschool children, through the efforts of a field staff that feeds back responses from viewers, *Sesame Street* maintains close contact with its program users.

Broadcast television has been found useful and effective as a component of instructional systems designed to reach and to affect learners who cannot be served by institutions of learning. With the benefit of this report, planners of such systems may better understand the success of the three projects reported and thereby avoid costly errors as new systems using broadcast or cable television come into being.

ACKNOWLEDGMENTS

The author wishes to acknowledge the assistance and cooperation provided by the staffs of the Children's Television Workshop (CTW), the Bavarian Broadcasting System, and the City Colleges of Chicago, Illinois. Robert Davidson and David Connell of CTW, Dr. Michael Schmidbauer of the International Institute for Youth and Educational Television in Munich, Dr. Walter Fuchs of *Telekolleg,* Bavaria, and James J. Zigerell of *TV College,* Chicago, Illinois, all deserve particular debts of gratitude.

The cooperation and hard work of the original researchers, John Pincus, Marjorie Rapp, and Daniel Weiler, deserve special appreciation; without their initial efforts the present report could not have been accomplished.

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I. INTRODUCTION: CHOOSING THE INSTRUCTIONAL PROGRAMS TO BE STUDIED

STUDY ORIGIN

This study began in the summer of 1971 in answer to an urgent request by the U.S. Office of Education (USOE). USOE was then considering whether to make another investment in a nationwide television series, following the success of its first investment, *Sesame Street*. In connection with its Model III (home/community-based) study program, USOE sought information on currently successful instructional projects using television to be applied toward a proposed series on career education focused on women in the home. USOE requested an analysis to point out key elements that would be important to the project's success.

A four-member Rand team began work on the study in July of 1971, considering TV projects then in operation. Since the study was requested to look only at home-based systems, many existing educational television projects were inapplicable, because they were school-based. The correspondence high school course that Japan offers was considered too remote for an on site survey within the time and resources available to the researchers. A leading example of home-based instruction using television today, the British Open University, had been in operation for only a short time. Each of the four team members visited a different project site during a 3-week period in 1971.

Three projects selected for examination are discussed extensively here: *Sesame Street*, the first series to be produced by the Children's Television Workshop (CTW); Chicago's *TV College*, produced by the City Colleges of Chicago, Illinois; and the Bavarian Broadcasting System's *Telekolleg*. The fourth selection, *The Advocates*, an Educational Television (ETV) public affairs series, was presented in the original USOE study. Since *The Advocates* had no specific instructional purpose, however, the author did not include it in the present discussion.

VALIDITY OF THE COMPARISON

The question might quite rightly be raised as to whether the three projects had enough in common for reasonable comparison. Two of the projects, *Telekolleg* and *TV College*, offered formal education at the secondary and higher education level, respectively, while the third, *Sesame Street*, directed at preschool youngsters, contained a totally informal instructional component. The comparison seemed appropriate because the USOE was considering doing something similar to *Sesame Street*, that is, a nationwide program on career education contained in an entertainment format. Thus, it was desirable to analyze the success of the *Sesame Street* series in comparison with other projects that had more mature target audiences, more highly specialized purposes, and fewer participants.

In retrospect, the inclusion of *Sesame Street* proved of more value, perhaps, for contrast than for comparison. The wide range between *Sesame Street* and *TV College* in cost per production minute (*Sesame Street* cost 25 times as much), and the even wider range in cost per target viewer (according to some estimates *TV College* may have spent more than 1000 times as much per viewer) served to point out the difference in kind between television as a mass medium and television as a means of reaching a highly specific audience.

The original conclusion of the study, largely implied, was that a career-education version of *Sesame Street* would not be a guaranteed success. This opinion is still held by the author. It may be possible, sometime, to mount a nationwide program based on top-quality entertainment that would reach an audience of millions of miscellaneous unemployed and mis-employed and deliver useful career education for all. It is highly unlikely, however, that a simple application of the *Sesame Street* model would succeed. For one thing, *Sesame Street* is presented to a population that is particularly avid for learning; for another, it faced no problem of motivation—something that might not be true, for instance, of a project directed at high-school dropouts.

SCOPE OF THIS REPORT

It is important to note that the comparisons and contrasts made in this report do not venture into the area of effectiveness. It is simply assumed that, since these projects are continuing in operation, they are satisfying the goals for which they were intended. This report does not, therefore, examine goals, nor address such questions as the relative educational merits of these projects over others not included in the study (e.g., a comparison of *Sesame Street* with *Misterogers' Neighborhood*, a public television children's program addressing the same audience at a slower pace, in a lower key, and with a more direct, personal approach). No evaluation is made of the *TV College's* straight lecture presentation in comparison with *Telekolleg's* more elaborate production techniques, or the fast-paced comedy of *Sesame Street*. No comment is included here on the criticisms of *Sesame Street* and

other CTW productions by educational writers such as John Holt, nor is there any discussion of why the British Broadcasting Corporation chose not to carry the program, or why it was enthusiastically adapted to foreign languages and cultures by several other countries.

Finally, the report does not attempt to present a complete study of any of the projects. Only those elements are discussed in detail which the author considered significant to the development of a general model that could be followed when using television for career-education purposes. The reader who requires further information on any of the projects will find an annotated reference list at the end of the report.

THE SURVEY

The three home-based educational programs surveyed during a 3-week period in July 1971—*TV College, Telekolleg,* and *Sesame Street*—varied widely in their development strategies, including objectives, methods, and scale of operation.

At the time of writing, *TV College* is starting its seventeenth year. It is a formal instructional service, programming about 5 hours a day over one local Chicago educational television broadcasting station. The service is aimed at adults in the metropolitan area seeking junior college degrees, course credits, or simply knowledge and skills. Currently about 500 credit and noncredit students are reached by each program, in addition to an estimated 30,000 unregistered general-interest viewers.

Telekolleg, now beginning its sixth year, is a formal instructional service of which television programming is a minor part, programming almost 2 hours daily over a network of transmitters covering the West German state of Bavaria. The service is aimed at home-based learners at the secondary-school level interested in taking vocational courses leading eventually to a standard examination roughly equivalent to an American high school diploma. Nearly 10,000 credit students participate during a typical year, plus some 37,000 noncredit students. Unregistered general-interest viewers are estimated at 300,000 to 400,000.

Sesame Street has completed 3 years of operation and is now in its fourth. It is a general viewing, entertainment and instructional series, programming one hour daily (except weekends) over some 250 stations nationwide. It is aimed at 3-, 4-, and 5-year-old preschool children, with children of the inner city as the special target audience. The show's producers estimated an average daily viewing audience of 5 to 6 million children during the first year, and as many as 8 million children by the middle of the second year.

Despite variations in aims, audiences, and methods, these three programs passed through similar phases from initial conception to operation. There appear to be three developmental stages prior to operational status: preplanning, planning, and production. Distinctions between them, however, are not always clear-cut. They either run into one another in an overlapping continuum, or they may occur simul-

taneously. Some activities, such as audience research and program evaluation, may occur at more than one stage. Program evaluation, for instance, if it is to have any effect on the formation of the system, must begin as soon as there is some pilot program to test and validate. Such formative evaluation is very important during the early part of the production phase, so that whatever is learned can be fed back into the production process to improve subsequent output as soon as possible.

Presented below in outline form is a typical series of phases, representative of most such projects, with the main activities generally characterizing each phase. The divisions are to some degree arbitrary, as are the tasks or activities designated within the division. In some planning designs, the production of pilot programs is classed under production rather than in the planning stage, where it occurs here. And sometimes the writing of the final programs is considered planning rather than production.

1. Development
   (a) *Preplanning.* Identifying the target population, establishing the need for the proposed service, establishing goals, identifying resources, and preparing proposals.
   (b) *Planning.* Assembling staff and other resources; designing the system, the curriculum, and the promotional strategy; scheduling of program production, transmission and evaluation; writing, producing, and testing pilot programs.
   (c) *Production.* Producing the program software; writing scripts; preparing audio tapes and printed materials.

2. Operations

   Operating the promotion campaign: bringing awareness of the program to the target audience through public relations, TV and newspaper publicity, and personal contacts; implementing the instruction; transmitting programs; operating all aspects of the system; evaluating and feeding back results.

In the case of experimental programs, the operations phase may be a predetermined length. In the three cases examined here, however, operation is expected to continue as long as funding is forthcoming.

It should be noted that research and evaluation play varied and constant roles throughout the development process. When there is a lull in operations, as for example at the end of a season before the new season begins, evaluation becomes a major activity; this is sometimes called an "evaluation phase."

In each of the case studies in Secs. II, III, and IV, the key components of the successful program have been summarized first. These are followed by a more detailed description and analysis of the project characteristics, presented in chronological sequence. The aim is to describe each system in enough detail to provide a basis for a comparison, the results of which are presented in Sec. V, "The General Model." Since each of the three projects was visited and described by a different individual

or team, the organization of each case study is somewhat different, has different terminology, and a different chronological scheme. This is necessary, however, because of the diversity of aims, methods, and organizational structures involved. These differences are largely reconciled in Sec. V in which a common pattern and a general chronology have been developed.

II. CASE STUDY 1: CHICAGO'S *TV COLLEGE*

ELEMENTS OF SUCCESS

The following elements of the *TV College* model are essential to its continuing success:

1. The *TV College* is built upon the facilities and resources, and uses the faculty and educational program, of a large and respected 50-year-old community college system. Regular college credits and grades are awarded, following the existing examination system.
2. It fills an educational need for a population in Chicago that is highly motivated but has inadequate opportunity to acquire higher education in other ways (e.g., women with young children). This characteristic makes its generalization to wider, less highly selected audiences inappropriate.
3. It is widely promoted by a variety of means throughout its broadcast catchment area.
4. Other elements beyond the television lessons classify *TV College* as a multimedia system. These include a printed Teleclass Study Guide written by the TV instructor; student homework assignments sent in by mail; telephone or personal contact with the TV or section instructor; midterms and final examinations taken at a local campus in conventional fashion; and text and reference books as appropriate.
5. Care is taken to avoid too-frequent repetition of course offerings; a 3- to 4-semester cycle between course rebroadcasts has been established. Thus, courses are always adequately enrolled and a student can obtain an Associate of Arts degree in 2½ years.

TV COLLEGE MODEL CHARACTERISTICS

TV College has for the past 16 years offered Chicago area viewers all courses required for the junior college degree, plus many electives. Seventeen program series or courses are telecast annually. Most courses include two different 45-minute

lessons a week; each lesson is broadcast during the day and repeated at least once during evening hours.

As of fall 1970, a total of 98,598 students had enrolled for credit since the start of operations in 1956, plus 88,520 noncredit enrollees. Credit and noncredit enrollments are relatively small compared with the size of the unregistered viewing audience; it is estimated that there are about 250,000 viewers who watch a single course regularly each semester, and perhaps a total of 500,000 viewers who watch at least a single lecture during each semester. Table 1 presents the 1971 figures for course enrollments and individuals participating in *TV College*. Course enrollments are the higher figures because some individuals enroll in more than one course.

TV College is an integral part of the City Colleges of Chicago system, which is comprised of 8 campuses.[1] A Dean of Television Instruction is responsible for planning, policy formulation, and overall direction of the program. A diagram of working relationships at *TV College* is shown in Fig. 1. Students register initially for television courses at one of the 8 campus branches of the system, where they are treated administratively as students of the branch, rather than of *TV College* itself. Admission requirements, placement tests, course prerequisites, and all other requirements except classroom attendance are the same for all students, television or on-campus.

Table 1

1971 *TV COLLEGE* ENROLLMENTS

	Course Enrollments			Individual Students		
Semester	Credit	Non-credit	Total	Credit	Non-credit	Total
Spring	2784	552	3336	1648	340	1988
Summer	913	197	1110	704	139	843
Fall	3738	357	4095	2152	254	2406
Annual Totals	7435	1106	8541	4504	733	5237

Preplanning

The preplanning for *TV College* began soon after Chicago's noncommercial educational television station (WTTW) began operations in the fall of 1955. Broadcast time for instructional uses then became plentiful and could be purchased by the Chicago Board of Education from the station's operators, the Chicago Educational Television (ETV) Association. The city's junior college system was at that time entering a program of expansion. In 1950 it had begun a phase of rapid growth

[1] Known formerly as Chicago City Junior College and Chicago City Colleges.

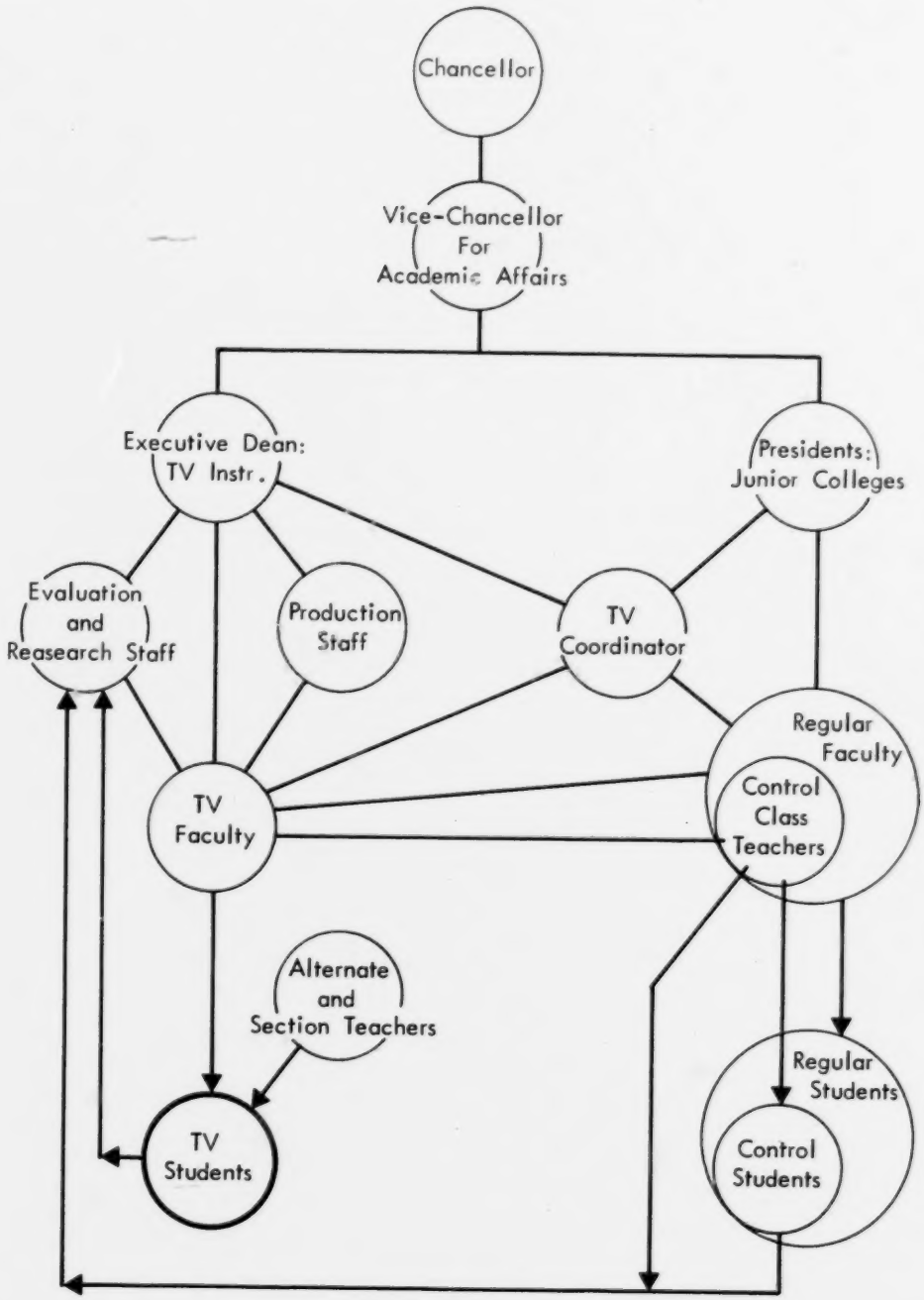


Fig. 1—Working relationships: Chicago *TV College*

during which three new branch campuses were added in as many years. As part of this revision it was decided to launch an experiment to see if television could be used to further broaden the service of the system.

It was necessary, of course, that courses offered by *TV College* should award full college credit, and for this reason accreditation by the North Central Association of Colleges and Secondary Schools was required. Accordingly, plans for *TV College* were submitted to the Commission on Colleges and Universities of this organization.

Although there was no existing precedent for a television project proposing to offer all the courses leading to the junior college degree, there had been success with many individual college courses offered for credit in various cities. The Commission accepted the project on an experimental basis and agreed to accreditation with the proviso that "conventional academic standards" be maintained.

The Ford Foundation, the main source of funds for ETV experimentation during the decade of the 1950s, put forward 44 percent of the $1,075,000 that was required. The Chicago Board of Education supplied the rest.

Planning

Funding was obtained in May 1956; the first lessons were broadcast in September of that same year. Thus, the planning phase of the first 3-year experiment spanned scarcely more than 3 months. During this period, arrangements were made to purchase television time, TV instructors were recruited and selected, a promotion campaign was begun, and the TV courses were prepared. Each TV instructor was relieved of all other duties in the college and was able to devote full time to the preparation of his course. The first step in planning each course was the preparation of a supplementary Teleclass Study Guide to be mailed to enrolled credit and noncredit students. These materials had to be produced as well as prepared during the 3-month planning phase. For the Chicago television programs, no separate production function existed until the thirteenth year because all lessons were presented live; production was simultaneous with operation.

Planning is an ongoing function at *TV College*. Of the 18 courses currently being offered each year, 7 are new and 11 are repeated, with updating as needed. While updating can be done over the summer, new courses are generally prepared during the school year when the television instructor is assigned full time to the *TV College*.

The remainder of this section on planning applies as well to the ongoing planning that is a continuous part of *TV College* operations, and not merely to the 3-month period of 1956 prior to the start of the initial 3-year experiment.

Faculty Recruitment and Preparation. For the most part, tenured faculty from the Chicago City College system are the instructors on *TV College*, although teachers are sometimes recruited from outside. Unlike the attitude toward television often found on university campuses, college and junior college faculty have generally proved responsive to the idea of television instruction. Volunteers are first screened for scholarly excellence and classroom competence; then final screening is made by the production staff on the basis of a teacher's television presence and appearance.

Once selected, a faculty member is trained by the television production staff for TV presentation of his course, and, if he has had no prior TV experience, he is given extensive opportunity for practice and rehearsal. A television teacher records his course over a semester, during which he is relieved of all other duties and is assigned full time to *TV College*. A full-time graphic artist is at his disposal to help him plan and employ visual materials. He prepares a draft of an extensive Teleclass Study Guide to be mailed to enrolled credit and noncredit students. He outlines the topics to be covered on the telecasts, selects published materials and audiovisual aids, plans assignments, conferences, and telephone conference hours, prepares examinations, and prepares research designs where required (if the course is part of a controlled experiment).

Study Guides sometimes run to 100 or 150 pages. The Guide states the objectives of the course, generally includes a synopsis of each lesson, a summary of the major points, lists of required and collateral readings, sample test items, and a list of assignments and due dates. Some Study Guides incorporate selected readings. Others include practice test questions or drill stimuli with answer sheets printed in water-soluble inks for immediate reinforcement.[2]

Most TV courses are presented the semester after they are recorded. But if a course is rebroadcast after the passage of some time, the teacher is relieved of a portion of his regular teaching load in order to review, edit, and tape revised sections to bring the course up to date. All *TV College* productions are now recorded and broadcast in color.

Before 1969, when courses were presented live, in addition to the faculty members giving the courses, alternate teachers were selected who could serve both as stand-bys in case of emergency and as assistants and critics to help the TV teachers sharpen their presentations. Currently, whenever required, section teachers at each of the campus branches are appointed. Each such teacher is in charge of a group of TV-at-home students, with whom he confers over the telephone and in person, meets in regularly scheduled practice sessions, and whose work he grades. Skills courses, such as English composition, require more section teachers than do knowledge courses, because students must submit written work more frequently.

Credit Student-Faculty Communication. Communication between faculty and students enrolled for credit is an essential part of the educational program of the *TV College*. Such interaction may take the forms of grading and commentary of homework or examinations, telephone conversations, personal conferences, lab sessions, or conversational practice for certain language courses.

In English composition, for example, the students write an essay each lesson. If both student and instructor act promptly, the homework assigned in one lesson may be completed, mailed, graded, and returned in time for the next TV lesson—a time sequence that is comparable to on-campus instruction. A TV course follows the same examination schedule and is evaluated by the same criteria that apply to that course when given on regular campus.

[2] The student moistens his pencil eraser and touches the number corresponding to the answer of his choice. If he is correct, it will smudge green; if not, red will appear.

The *TV College* instructor or section teacher schedules two telephone hours each week to answer the credit students' questions about the lessons. Students may also make appointments for personal conferences with section teachers at the nearby junior college campuses. For some science courses, laboratory sessions are scheduled regularly every few weeks at a branch campus, and for foreign-language courses, 8 biweekly meetings are held for conversational practice.

Although *TV College* feels no obligation to provide regular channels of communication between its noncredit students and faculty, the noncredit students are free to telephone and write the instructors.

Operations

Because the production of programs broadcast live was simultaneous with their distribution, the planning effort merged immediately into operations in the *TV College* model. Only during the last 3 years, when programs have been prerecorded for viewing at later dates, has there been a separate production activity. In the case of such a continuous, well-organized model as *TV College,* this phase must be considered part of ongoing operations.

The success demonstrated by *TV College* in its experimental 3-year period led to a commitment from the Chicago Board of Education for continuing support of the television effort. With refinements to the model introduced as a result of the first 3-year experience, *TV College* has continued to broadcast and to extend the variety and sophistication of its course offerings. Operations in the succeeding years have conformed closely to the model developed during the early years, except for an attempt, beginning in 1970, to reach new audiences through technical-occupational courses.

Only one adult education course has thus far been presented. Offered in the spring of 1969, this course was funded by the State of Illinois Office of Vocational Education and shot on location at different industrial plants, to show where jobs of various kinds were available. Students officially enrolled in this course for adult-education credit numbered 112; 161 sent in for materials. Such a relatively low official enrollment, when compared with required community college TV courses that average 437, indicated to management that special funding would be needed for career and occupation series. Additional adult-education courses are now being planned in ecology, consumerism, real estate, office services, and data-processing.

Promotion

TV College is publicized widely throughout the Chicago metropolitan area; it is available to the 7 million people living within broadcast range of Chicago's public broadcast outlets, WTTW Channel 11, and WXXW Channel 20. Before each term, an information folder describing the schedule of courses is sent to a mailing list, built up over the years, of over 35,000 people; 15,000 more copies of the folder go to institutions, such as libraries, schools, and government offices. WTTW runs *TV*

College "previews" and "spot commercials," and interviews each teacher on talk programs. For the last 2 years, commercial TV and radio stations have run public-service announcements prepared by *TV College*. The program series is also publicized in newspaper and radio news and feature stories, as well as in conventional newspaper TV listings.

Evaluation

A continuing evaluation program gathers data about the size and composition of the viewing audience (both enrolled and not enrolled), investigates which aspects of the programs are most attractive to the enrolled audience, and compares the educational effectiveness of TV courses with that of similar courses taught by conventional methods, or by classroom television, or by combinations of other means. Information derived from these studies is used in the planning of new course-offerings and in the modification of presentation techniques. Both internal and external evaluations have been used. In the most recent study of the program, external evaluators were employed to help *TV College* assess new directions for its continued future success.

At the outset of the planning, heavy investment in evaluation of the educational effectiveness of *TV College* established the fact that at-home television students were apt to do as well as or better than their classroom contemporaries in any given course. Continual research and evaluation has defined *TV College* audience characteristics more closely. Students who are enrolled for credit tend to be intelligent, highly motivated, and ambitious. They are serious and career-conscious; their average age is 29 years, and their average IQ is 110 to 120. They are the kind of students for whom success can be predicted in college-level programs. They display a composite of lower-middle-class traits; almost half of them are preparing for teaching careers; fully 75 percent are women. Students who enroll without seeking credit are generally more sophisticated and possess more formal education than do the credit enrollees.

Based on the findings of comprehensive research into audience characteristics, *TV College* intends to expand its programming to include special-interest groups, such as those with deficiencies in basic literary skills and those with special occupational needs and interests.

BUDGET AND COSTS

The original 3-year experiment was funded by a $475,000 grant from The Ford Foundation and $600,000 from the Chicago Board of Education, at an average cost of about $350,000 a year. (We have no detailed breakdown of these figures from 1956 to 1959.)

Current operating budgets run from $850,000 to $900,000 annually, divided approximately among three categories as follows: (1) $300,000 for station operations;

(2) $275,000 for teacher salaries; (3) about $250,000 for all other operations including *TV College* staff, overhead, and equipment purchases. *TV College*, now funded under the City Colleges of Chicago, receives about two-thirds of its support from Chicago real-estate taxes, and the remainder from the State of Illinois—the latter allocated on the basis of credit hours generated by students enrolled in courses.

Outside funding is also sought for special projects not aimed at credit students. The most recent of these is a $72,000 grant from the National Endowment for the Humanities and the Field Foundation of Illinois to help underwrite production costs for a 6-program art appreciation series being filmed in the Art Institute of Chicago.

Table 2 lists the major budget categories and annual amounts for the 1972-1973 12-month period.

Table 2

TV COLLEGE ANNUAL BUDGET, 1972-1973

Budget Category	Budgeted Amount	Totals
Academic salaries:		
Administration, support	$ 69,930	
Nonacademic salaries:		
Graphic artists, clerical, etc.	65,747	
Subtotal		$135,677
Indirect instruction:		
Producers, printing, stock handlers, etc.	$113,856	
Direct instruction:		
TV teachers and support	210,766	
Videotape stock	39,375	
WTTW studio and transmission fees	385,312	
Subtotal		749,309
Evaluation	$ 10,000	10,000
Grand total		$894,986

III. CASE STUDY 2: BAVARIA'S *TELEKOLLEG*

ELEMENTS OF SUCCESS

The following elements of the Bavarian state's *Telekolleg* model are essential to its continuing success. Some of these are special circumstances that do not obtain elsewhere.

1. *Telekolleg* is not merely a broadcasting service, nor an opportunity for general educational improvement; it is an integral part of the state instructional system, leading to a recognized examination, the passing of which can open doors to employment and further education.
2. More than a series of television lessons, *Telekolleg* is a multi-media instructional system of interrelated components with excellent printed materials and group meetings for instructor-student and student-student interaction every third week. In this system, television programs and their development use no more than one-third the resources of the system.
3. *Telekolleg* fills an educational need for many, both maturing and mature, who are already motivated to seek further education but because of full-time employment or remoteness of residential location cannot attend the existing institutions for career education.
4. *Telekolleg* television lessons were produced by a television network with 20 years of experience in planning, producing, scheduling, and budgeting. The network employs creative people of the highest caliber.
5. *Telekolleg* works closely with several institutes that devote substantial effort to research and evaluation; their work provides the program's planners and producers with excellent feedback in such areas as analysis of student population and effectiveness of instructional method.

TELEKOLLEG MODEL CHARACTERISTICS

Telekolleg offers an opportunity for a student in his own home to study the curriculum of the state vocational school, the *Berufsaufbauschule,* and to prepare

himself for the state-administered examination, the *Mittlere Reife*, the approximate equivalent of an American high school diploma, except that passing entitles the student to enter a technical school but not a university.

Telekolleg offers a full course of study, comprising some 14 courses containing 468 lessons in all, each of which includes a half-hour television broadcast. The main courses are German (grammar and composition), English language, mathematics, history/geography/social science, and physics. Additional courses are available in biology, economics, business management, electrical engineering, chemical engineering, and bookkeeping. Only one course, technical drawing, requires any psychomotor skills: the rest would all be considered academic subjects not requiring any special instructional facilities or equipment. A more detailed discussion of the *Telekolleg* curriculum and its approach to learning may be found in the Appendix.

A "full-time" student who takes several courses simultaneously can finish in 2 years; some take 3 or 4 years. The entire *Telekolleg* TV course of study has been offered three times from start of broadcasting (January 1967) to the present (August 1972). In 1969, more students of the *Telekolleg* passed the *Mittlere Reife* than did examinees from all 92 of the existing *Berufsaufbauschule* combined.

Latest data indicate that almost 40,000 students make full use of *Telekolleg* in preparing themselves for the *Mittlere Reife* or its equivalent. In addition, some 100,000 people are known to be taking individual courses for general educational development. All 140,000 pay for the printed materials, purchasing them in a book store or ordering from the publisher directly; but most of them are general-interest viewers who do not prepare correspondence papers, attend group sessions, or take examinations. Another category of participant, those who watch the programs but do not purchase the printed materials, is estimated at 300,000 to 600,000 persons.

For some courses as many as 5 percent of all TV sets in Bavaria are regularly tuned in to *Telekolleg*. Its actual share of the viewing audience, considering only those TV sets that are actually turned on, would of course be larger than this. Even in a community where there are only three channels from which to choose, 5 percent is considered a respectable rating for an educational program. (The highest rating estimate for *Sesame Street* did not exceed 7.5 percent.)

Although developed specifically for the needs of Bavaria, the *Telekolleg* system is also used in 4 other German states in its entirety, in part in 2 more, and in German-speaking Switzerland. The German state or regional broadcasting network, operating as an arm of the state, undertakes a far broader social and civic responsibility than does a U.S. commercial network. This explains how such a project as *Telekolleg* could have been conceived and initiated by broadcasters, rather than by local educators or by educational officials of the federal government.

Because it makes use not only of television lessons, but also of textual materials that, not being time-bound as are TV programs, can be studied at length, reviewed at will, or memorized if desired, the *Telekolleg* system is more ambitious, more serious, and a more effective program than many of its forerunners in home-based educational television systems. It also uses audio media: phonograph discs may be sent to the student to accompany the English course; the telephone has been used for remote access to a language lab drill-and-practice system.

Printed study materials are generally of the programmed instruction type, where the learner's response is elicited by questions that are answered correctly on the next page. The correspondence assignments are likely to be problems that the learner is to solve without prompting; these offer the greatest challenge. Some courses require a complex student response. The course in technical drawing, for example, provides exercise sheets with which the learner, using his own set of tools, may follow step-by-step demonstrations as they are presented on television.

The final component of the *Telekolleg* system, the 5-hour group meeting every third Saturday, called the *Kollegtage*, adds another instructional method. In the ideal situation under a gifted teacher, the *Kollegtage* can incorporate spirited discussion of the material under study. There is supposed to be time for individual tutoring and guidance, although in a group of 20 learners this would necessarily be quite limited.

Of primary interest for this report is the procedure by which the planning and development of such a complex undertaking was achieved. The various stages and activities in *Telekolleg* development are shown in the chronological chart of Fig. 2. A rough approximation of the extent of effort relative to previous effort is indicated by the width of the shaded bars.

Preplanning

Telekolleg was the first fully instructional series that the Bavarian Broadcasting System produced, although it had been preceded by a certain amount of supplementary or enrichment programming for use in the schools. The extent of general home-viewing these programs enjoyed convinced the broadcasters that there was a general need for home-based learning, possibly as a supplement or alternative to learning in school.

Implementing this conclusion then led to the decision to consider a home-based version of the conventional *Berufsaufbauschule*. The extent of the preplanning for this *specific* project, and the number of people taking part in it are hard to define, since general surveys and studies such as those described below are a continuous activity of the Bavarian Broadcasting System and other German networks.

The *Telekolleg* was preceded by a number of general surveys in which special interest was given to five aspects [6]:

1. A socio-cultural evaluation of the popular desire for social advancement, as far as this desire is connected with self-improvement;
2. A study to determine the extent of lack of professional qualifications at the intermediate level, noted in public services, administration, and industry;
3. A socio-cultural examination of the locations of the main types of schools valid for aspects (1) and (2);
4. An inquiry to determine which types of school, from among those already established, would best meet the needs, arising from aspects (1), (2), and (3), and would be sufficiently receptive to allow new teaching media and methods to be introduced;

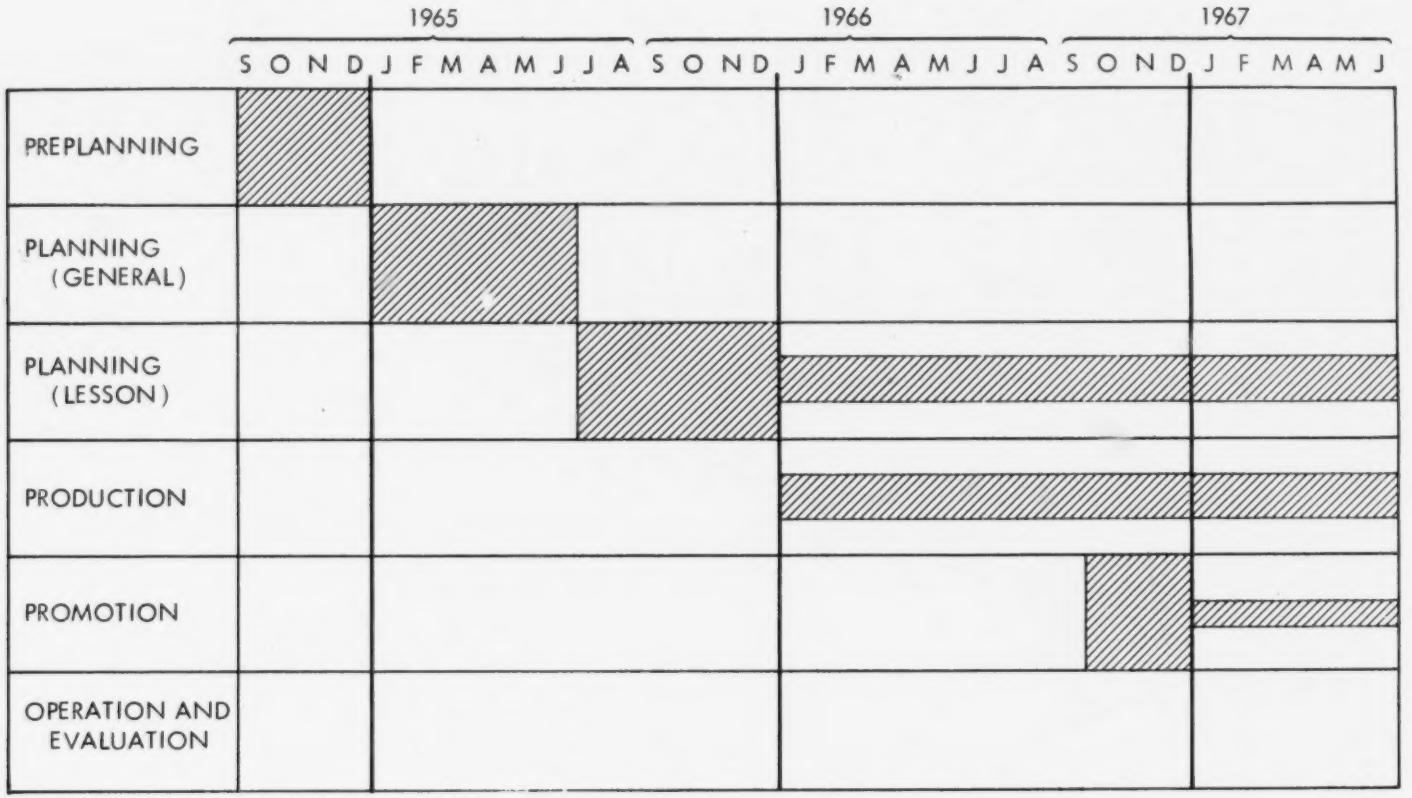

1965
1966
1967
S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J
PREPLANNING
PLANNING (GENERAL)
PLANNING (LESSON)
PRODUCTION
PROMOTION
OPERATION AND EVALUATION

Fig. 2—Summary of development and operation phases: *Telekolleg*

5. An opinion poll to ascertain the study habits of persons taking correspondence courses or participating in the *Zweiter Bildungsweg* (an alternative way for people in employment to gain secondary education).

The general results emerging from these surveys and studies may be summarized as follows:

1. In contemporary society, the demand for information is not satisfied with current events and entertainment; society must be offered the type of knowledge that will ultimately permit greater social mobility. It has also been noted that this wish for social mobility is paralleled by a deep desire for personal advancement and enlargement of scope.
2. In the Federal Republic of Germany, general educational publicity in recent years has presented the concept that in a changing society, intellectual mobility is a better guarantee of social status than material wealth or a too-specialized professional experience.
3. The main impact of this publicity has been to persuade parents to send their children to a secondary (grammar) school from the age of 10, in the hope that they will proceed to a university. Nevertheless, both industry and administration are short of personnel with intermediate qualifications, that is, below the level of "*Abitur,*"[3] at the "*Mittlere Reife*"[4] stage.
4. Because only 20 percent of the population obtain a qualification higher than elementary school level and because there is a growing desire for self-improvement, the school-leaving certificates of the *Realschule* or the equivalent institutions of the *Zweiter Bildungsweg* are regarded by the general public as a means of attaining social advancement.[5]

An extensive search for funding was begun in which industrial firms, foundations, and agencies of government were approached for support. Eventually, joint support was obtained from three sources: the broadcasting budget of the Bavarian Broadcasting System, the State Ministry of Education, and the Volkswagen Foundation.

Planning

Planning for *Telekolleg* began in early 1965. Four persons from the network devoted full time for 6 months to fund-raising and general planning. They realized, of course, that a program leading to a state diploma would have to be done cooperatively with the state. They also knew that simple broadcasting of programs would

[3] University entrance qualifying examination.

[4] "Middle exam": roughly similar to our high school equivalency, or General Educational Development (GED) test; passing this examination qualifies for entrance to junior-college-level *Gymnasium* or higher technical schools but not to university.

[5] European school-leaving certificates are similar to our diplomas.

not result in the necessary learning, and that other student activities, some beyond the ability of the broadcaster to provide, would be essential.

Accordingly, an advisory council of some 14 persons was appointed to discuss and establish policy for the *Telekolleg* and to give all interested institutions a part in the project. This group included, among others, representatives of the trade unions, management associations, teacher associations, farmer associations, the Volkswagen Foundation, and the universities. In a series of meetings held every few weeks, the producers and the council defined a target audience and decided upon the general curriculum. An agreement was formulated between the state and the *Telekolleg,* specifying the responsibilities of each: the network was to provide the TV programs and prepare all the printed materials; the Ministry of Education was to handle the correspondence study and hold the *Kollegtage* (group meetings held every third week). During this general planning period, the planners held frequent meetings with officials from the Ministry of Education, professors of education, and others to determine the best pedagogical approach for each subject to be presented on television. The council's major responsibility was accomplished during this period. After that they were kept up to date on developments by means of written progress reports every 5 or 6 weeks. They were later invited to attend screenings of some of the pilot programs, and in general were given the feeling that they remained in partnership in the project, but were no longer required to give substantial time or effort.

General planning merged into lesson planning with the start of the second 6-month period of 1965 and with this began a period of much heavier activity. Approximately 120 persons began to spend full time writing television scripts and associated printed materials and preparing the visual materials that these required. All but 15 to 20 of these were from outside the Bavarian network. The key network people were the 5 or 6 *Redakteurs* or editors, each directing several teams of 8 to 15 people. Composed of subject-matter specialists, teaching-method specialists, the TV editor, writers, and free-lance graphics designers, each team was responsible for planning the lessons in a single subject.

The planning of lessons continued at about 10 lessons per month, until, by the beginning of 1966, some 60 lessons had been planned. Lesson planning then dropped to a level of 5 lessons per month because the production phase of the project had begun and the same 120 persons became engaged both in lesson planning and in studio-production activities. The planning process was no great problem for the Bavarian network, because the producers followed patterns that had been developed over nearly 20 years of television production experience.

Production

Production began in early 1966. By January 1967, when the first programs went on the air, about 40 percent of the basic *Telekolleg* lessons, 130 programs, were on tape, although in the opinion of the director of *Telekolleg,* Dr. Walter Fuchs, 60 percent (rather than 40 percent) would have been a more comfortable margin to

begin with [9]. Scheduling network facilities for production was sometimes difficult, he found, and it was easy to get behind schedule. By this time, in addition to the 130 tapes, another 130 lessons were prepared and ready for production, and 130 more were in the planning stage. The network began broadcasting the programs with relatively few tapes completed so that feedback from formative evaluation studies could be incorporated into production as rapidly as possible.

A period of 4 to 6 months was needed for the planning and production of the printed materials. Scheduling was very tight and stand-in writers were kept ready to step in and continue the planning schedule whenever a first-string writer had to temporarily drop out because of illness or other reasons.

During 1967, production continued at the rate of 130 programs every 3 months (13 per week, or 2 every day). Two studios were in constant use; *Telekolleg* was probably the major effort of the TV production center during that period. At the end of August 1967, or soon thereafter, the original 468 lessons were on tape. Most of the tapes were produced in black and white because there are few color sets in Bavaria. Only the science lessons were made in color.

Operations have continued to expand through 1971. Production continued on remakes of the first lesson series, *Telekolleg I,* and a new series, *Telekolleg II* was begun (see the Appendix). Two producers were each responsible for producing 100 programs per year. Each producer had 4 to 6 directors working under him; each director taped one program every two weeks. The total elapsed time between the start of planning and completion of production of a *Telekolleg* TV course averaged about 6 to 8 months.

Telekolleg can produce a 30-minute lesson in one full studio day. This time includes 5 to 6 hours using full facilities; the rest of the day is devoted to setting and striking scenery and lights, and dry rehearsal (that is, without cameras). The ratio of studio time to program time is 16:1; the ratio of camera rehearsal to program time is more like 10:1. This ratio is considered fairly standard in U.S.-TV production, even for dramatic shows and other fairly complex productions. It is low, however, by German standards.

There are 6 TV studios at the Freiman production center of the Bavarian Broadcasting System. One of these is generally in use each day for *Telekolleg.* At this rate, a maximum of some 240 lessons could theoretically be taped in a year; actually about 200 are produced. Some days are lost because of the scheduling of other more urgent network productions.

Promotion

In October 1966, 3 months before the start of broadcasting, 10 or 12 persons from the staff of the Bavarian Broadcasting System were assigned to a promotional campaign, to prepare newspaper advertisements and short TV "commercials" about *Telekolleg.* In the first phase of a 2-stage campaign, 18- to 25-second advertisements were aired several times daily on TV channels. The Ministry of Education cooperated by announcing the service in all the state's secondary schools. After the

program series went on the air, this promotional activity dropped to about 5 percent of its maximum level.

The second stage of student recruitment began as soon as the respondents were heard from. Some 30,000 persons had responded to the promotional announcements and were then sent detailed information and enrollment forms. About half of the original respondents returned their enrollment forms accompanied by a DM25 fee ($6.80). About 8,500 participants in 136 towns came to the first required meeting, the *Kollegtage*.

Evaluation

Evaluation of the pedagogical approach used in *Telekolleg* revealed several important factors that caused revision of lesson material; these were incorporated in the planning of the second *Telekolleg* series. Figure 3 summarizes this evaluation data.

It was found, for instance, that the content of the TV lesson should at least be summarized, if not reproduced in full, in the printed materials. This was needed, probably, because of the inaccessibility of the TV lessons for review. After a lesson had once been broadcast and repeated once or twice, it was unavailable to the student for 2 years' time—until it appeared again in the next course or program cycle.

Evaluation also determined that the printed materials should contain some preview material on the nature of exercises to be done before viewing the television lessons to which they would refer. This would prepare the student for the learning to come and motivate him to want it, partly by making him dissatisfied with his present level of knowledge or skill in the particular subject area.

Many *Telekolleg* students did not learn as much or as readily as expected, and this was diagnosed as lack of sufficient time devoted to study. It was decided to put more effort into motivating the student to study, both in the TV programs and in the *Kollegtage*. Participants in *Telekolleg* were discovered to be a somewhat different group than the target audience the producers had originally defined. Out of 10 assumptions made about the target population for which the courses were designed, only the following 4 turned out to apply to the actual *Telekolleg* audience [5, p. 46]:

1. The participants were largely young people.
2. *Kollegtage* meetings were attended largely by students with a low level of education and younger people who would accept school-teaching methods.
3. The majority of the participants traveled only a short way to and from work.
4. Professional and vocational aims were named most often as the motives for participation, rather than general interest and educational improvement.

Totals in Fig. 3 may not reach 7000 because some students failed to answer or their answers were ambiguous.

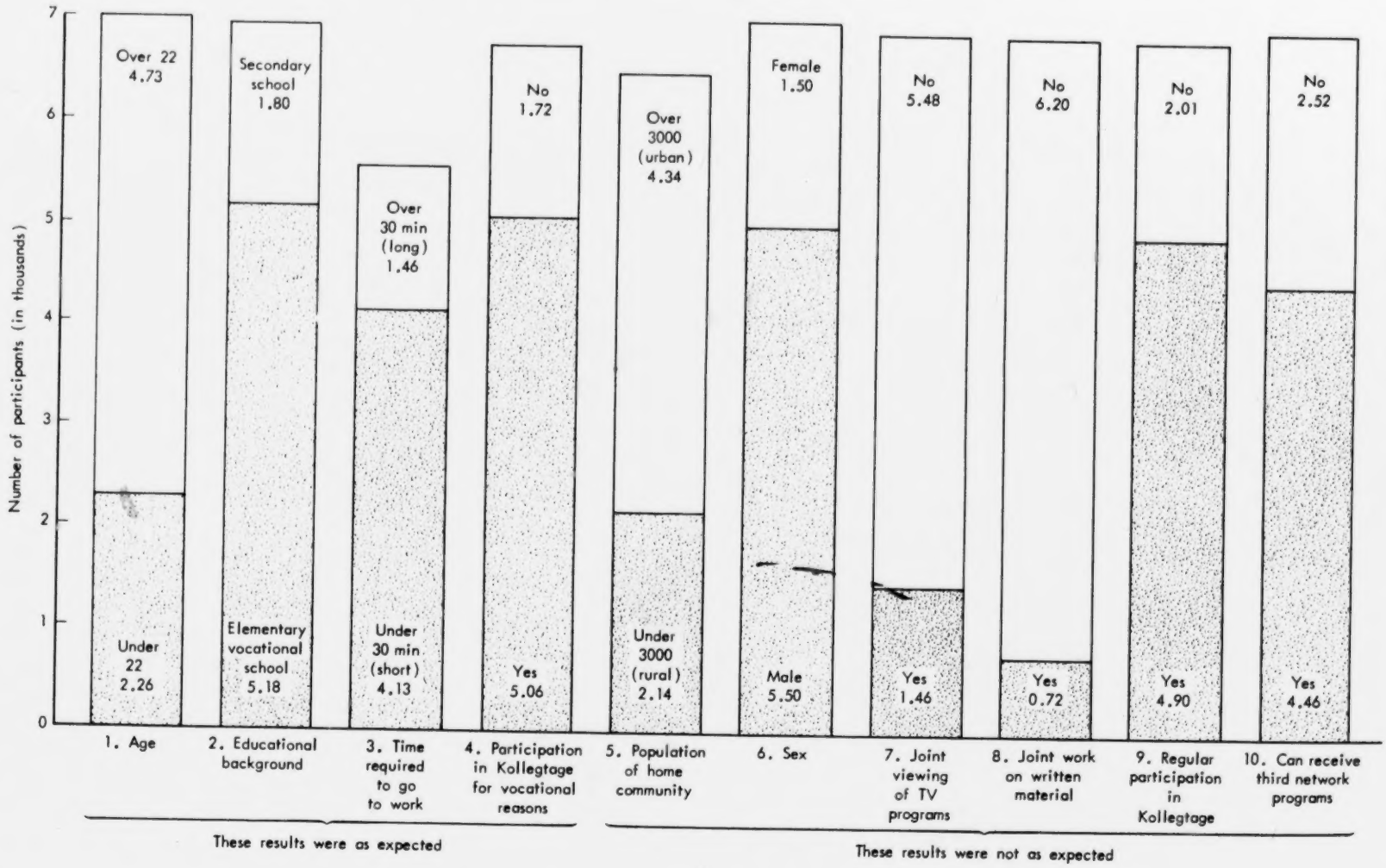


Fig. 3—Summary of first evaluation of *Telekolleg* audience data
(sample = 94 percent of total population)

The fact that the nature of the student population could only be conjectured in advance is significantly applicable to any broadcasting system. Although in this case unverified expectations did not require serious revision of the teaching materials, other such projects might not be so fortunate. *Telekolleg's* experience supports the suggestion that pilot programs in single communities might well be undertaken in order to determine whether target audiences will actually be reached.

Three general types of *Telekolleg* participants emerged, and these were classified as groups A, B, and C. Group A participants were motivated by the intention of preparing for the *Mittlere Reife* (the original target audience of the planners). Group B participants participated in selected courses, did the work, and took exams, but were not interested in the *Mittlere Reife*. Group C participants purchased the printed materials and followed the lessons, but took no exams. Further data on these groups can be found in the Appendix.

FUNDING AND COSTS

Telekolleg is funded by three organizations: (1) the Bavarian Broadcasting System, which initiated the project and is responsible for the preparation of the television and printed materials and the broadcast service; (2) the Bavarian Ministry of Education, which handles the correspondence study responsibility, the *Kollegtage*, and the examinations; and (3) the Volkswagen Foundation, which supplies one-fifth of the funds. Amounts of support for the first 4 years of *Telekolleg* planning and operation are shown in Table 3.

The ongoing budget for 1971 and beyond will be about DM250,000 annually, plus a broadcasting budget of DM170,000. The Ministry of Education budget for continuing the *Kollegtage*, the correspondence work, and the examination schedule is some DM450,000 per year. Thus, the ongoing annual budget will total around DM870,000 ($236,000) per year, about 20 percent of the annual cost for each of the first 4 years.

Table 3

TELEKOLLEG SUPPORT (1966-1970)

Source of Funding	Amount		
	(DM Million)	($ Million)	(Percent)
Bavarian Broadcasting System	7	1.9	47
Ministry of Education	5	1.37	33
Volkswagen Foundation	3	0.81	20
Three-year total (1966 through 1969)	15	4.08	100
Average annual total	3.75	1.02	---

It is important to note here that the DM170,000 broadcasting budget is only about 20 percent of the total. It is not clear, however, whether this includes ongoing production or transmission costs only. One unpublished evaluation of *Telekolleg* estimates that the costs of planning, production, and broadcast of the TV programs were 28 to 33 percent of the total *Telekolleg* cost. As far as cost is concerned, then, it seems clear that the television component of *Telekolleg* was indeed a minor part.

Reports on *Telekolleg* quote figures that show a wide difference between the per-student costs of the television teaching and that of conventional schools. *Telekolleg* reports make this enthusiastic statement [5, p. 41]: "After one year's operation, estimates show[ed] that *Telekolleg* students cost the state one-sixth of the sum spent so far by traditional methods of schooling to provide pupils with a similar standard of qualification."

The Bavarian government spends DM1070 ($290) per year for each elementary school pupil, DM2240 ($610) for each *Realschule* pupil, and DM2280 ($620) for each student in *Gymnasium*. These costs are presumably based on some sort of average daily attendance, not on the number of graduates.

To compare *Telekolleg* costs with these, we divided the annual total of those who passed the *Mittlere Reife* examination (only 26 percent of the original enrollment) into the total annual cost. The resulting figure was DM434 ($119). Whether this is a meaningful comparison or not, at least one can be sure that, with an increase in the number of learners who participate in *Telekolleg*, the total costs will not rise in proportion, and with more successful examinees the per-capita cost will be lower still.

IV. CASE STUDY 3: CTW's *SESAME STREET*

ELEMENTS OF SUCCESS

The following elements of the Children's Television Workshop (CTW) model were essential to the success of *Sesame Street* as an educational television program:

1. CTW chose an entertainment format that would appeal to children—rapidly paced, humorous, and as professionally produced as the best commercial programs.
2. Preceding the formal planning period, CTW devoted substantial effort to identifying and recruiting talented people with the range of skills that would be required to make this kind of show work; these formed the nucleus of the *Sesame Street* staff.
3. CTW mounted a well-funded planning effort for preproduction research and development over a period of 18 months. Planners aimed at establishing instructional goals, understanding the determinants of program appeal for the target audience, and evaluating show content and format for educational effectiveness.
4. CTW established a close working relationship between research and production staffs, reinforcing informal working relationships with structured devices that ensured continued mutual understanding and cooperation.
5. CTW sought local station agreement to broadcast the show at times best suited to the viewing habits of the target audience, preschool children.
6. CTW used advisory panels of educators, psychologists, and other experts to help with the formulation of program objectives, and to review the progress of the development effort.
7. CTW devoted heavy resources to public relations and audience promotion; a grass-roots campaign ensured audience utilization of the show and of nonbroadcast collateral materials.
8. CTW continues substantial research and evaluation that leads to continuous modification and refinement of broadcast and nonbroadcast material.

In addition to these elements CTW made several critical management decisions (some quite early) that had a special bearing on the show's success:

1. That program appeal and educational effectiveness be inseparable; that the highest quality commercial television production techniques be linked

with the best that professional academic research has to offer;

2. That the program be designed as a "magazine" format, keeping a fast-moving pace; that program material be pretested on a segment-by-segment basis; and that the production staff be flexible about modifications, refinements, or scheduling of repeat segments to reinforce learning;
3. That the production staff be steeped in professional, educational, and curriculum problems from the outset, rather than being "handed" a set of curriculum goals and told to produce a show;
4. That a strong black image for the show be deliberately sought and reinforced from time to time by guest appearances of black celebrities, because the show was aimed principally at the urban disadvantaged preschooler.

CTW MODEL CHARACTERISTICS

The CTW developmental model can be characterized as a series of largely distinct but partially overlapping activity phases, that led in two years to the establishment of a successful operational model for the production and broadcast of educational television shows for preschool children. A diagram showing the sequence of and interrelationships between various phases of activity is given in Fig. 4. The CTW staff now numbers nearly 200 workers grouped by function into several departments: administration, production, research, field services and community relations, special projects, and foreign programming, technical operations, nonbroadcast materials, legal, and business and office services. A Board of Advisors and Consultants, a Research Advisory Committee, and numerous consultants continue to serve the workshop.

The *Sesame Street* developmental model was closely followed when, over another two-year period, CTW created *The Electric Company,* a new program designed to help teach reading to children 7 to 10 who were experiencing difficulties in school. This program series began broadcasting in the fall of 1971.

Preplanning

Preplanning for the CTW effort began in 1967 with an extensive survey undertaken to collect opinions of leading psychologists, educators, and specialists in the field of children's entertainment on the potential uses of television as an educational stimulus for young children. The target audience specified was preschool children, particularly of the inner city, together with the general aim of the proposed television program series: to foster intellectual and cultural development.

Talented and potentially interested and available staff were identified early in 1968. These included people skilled in television promotion, utilization, administration, and operations. Potential members for a board of experts to become the CTW Board of Advisors and Consultants were identified and contacted. Within the next few months these steps were completed: the nucleus of the staff was brought

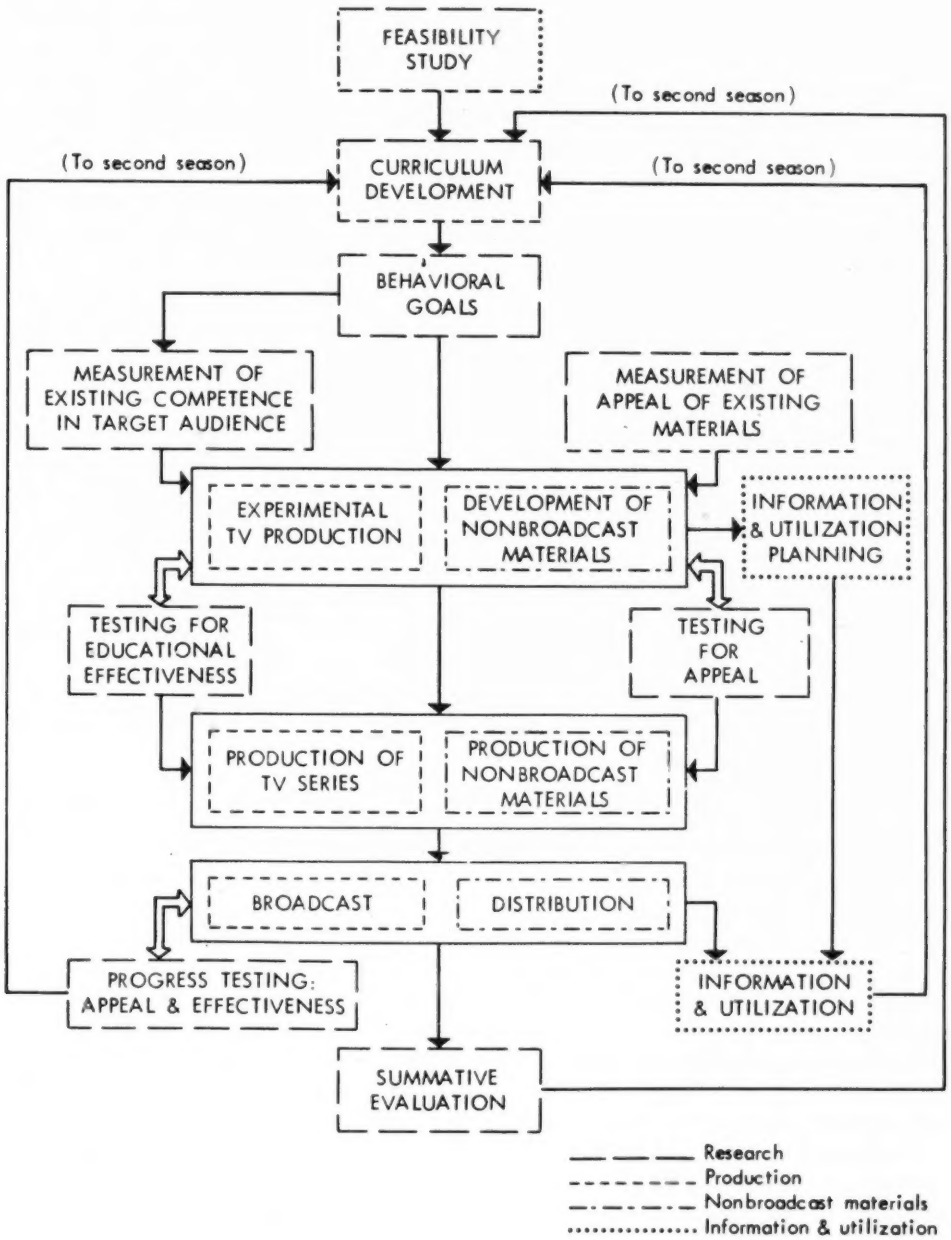


Fig. 4—The CTW Operational Model

together; the final selection of the Board was made; and a tentative developmental and operational model was adopted. Then the staff began shaping the actual organizational format of the Children's Television Workshop and seeking support funds. Approximately $8 million was obtained for the first two years of operation: half of this came from the U.S. Office of Education, and the rest from The Ford Foundation, the Carnegie Corporation, and several other sources.

Planning

During the planning stage, the staff defined instructional goals for the programs. The CTW staff nucleus met a number of times with a wide range of experts during the summer of 1968 to discuss various aspects of child education and to formulate initial curriculum goals. Concurrently they obtained recommendations on pertinent aspects from the Board of Advisors and Consultants.

Then, during the fall of 1968, CTW management decided on basic educational objectives which were translated by the research staff into behavioral and operational terms. CTW organized its curriculum goals into three categories: symbolic representation, problem-solving and reasoning, and familiarity with the physical and social environments. These were clarified for writers and producers through the medium of a *Writer's Workbook*. In the *Workbook* each curriculum objective is discussed at length, different strategies for achieving the objective are suggested, and a variety of instances of use of the objective are provided. The *Workbook* has become an essential structure linking the ideas and creativity of the research and production staffs.

Next, research- and production-staff operating relationships were developed. On the basis of research-staff findings and recommendations, the production staff decided how much time to allot to each curriculum goal during each show, and writers produced scripts designed around these goals. The completed scripts were reviewed by the research staff for educational soundness, and the first 30 scripts were also reviewed by the CTW Board of Advisors and Consultants.

As a guide to production planning, the research staff both reviewed existing data and performed original research in order to determine the competence of the target audience in various curriculum areas. In late 1968, the viewing habits and program material preferences of the target audience were studied, to better understand the kinds of subjects and formats that could capture and retain the attention of preschool-age children. Also at this time (late 1968 and early 1969) long lead-time items, such as animation and film segments, were contracted for, in accordance with the goals of the curriculum. These items were later to be used as a library of material from which the production staff, with the help of the research staff, could build the skeleton of each show, with the balance of the material and connecting story themes supplied by the writers.

In the spring of 1969, the research staff pretested individual show segments before target-audience samples to determine their probable educational effectiveness, in terms of comprehension and achievement of program content and format. Later that summer, they produced five pilot shows and tested them in two cities for

educational effectiveness and program appeal. As a result of this work, the production staff was able to make program refinements, and the research staff itself could improve its testing techniques. CTW's summative evaluation plan was now completed, and the pretesting of a sample population accomplished. The scheduling of broadcast programs during the hours that are most convenient for preschoolers, 9 a.m. to 11 a.m. daily, was an important part of the planning process. In order to secure optimum time slots, the CTW administrative staff visited many local stations and school districts.

Production

Videotaping of one-hour shows began in late summer, 1969, at the rate of 5 to 8 shows a week, with taping running 3 to 4 weeks ahead of scheduled broadcast dates. Originally, the show was broadcast on the 180 educational television (ETV) stations in operation across the country. Over a period of 8 months 130 shows were produced and broadcast, with selected programs rebroadcast over the summer of 1970. By 1971 the series was broadcast on 202 public television stations and 65 commercial television stations (in areas without public television); it reached approximately 75 percent of U.S. households. At present, the series is carried on more than 250 stations, many of which run each program 2 or more times.

As soon as the first shows were produced and broadcast, collateral instructional materials, such as the Parent-Teacher Guide to *Sesame Street* and *Sesame Street Magazine*, were introduced and distributed to parents and teachers through local television stations, schools, and the CTW field-services staff. Additional nonbroadcast materials (books, records, games, toys) were later developed, largely through manufacturer proposals tested and screened by the CTW research staff and the Board of Advisors and Consultants; these were marketed through normal commercial channels.

Promotion

CTW felt that it was necessary to create more audience attention and reaction shortly before the broadcast of the first show in November 1969. To do this they hired a major public relations firm to assist in extensive audience promotion and to campaign for local program use. CTW augmented the professional firm's efforts with a door-to-door campaign to ensure audience use of the show and of the collateral materials.

Audience promotion activites, begun in the planning stage, were substantially increased in the production phase, using three different approaches.

In the first of these, CTW intensified a national public relations campaign aimed primarily at mothers and teachers begun in the months before the first airing of *Sesame Street*. As part of this, CTW funded local stations in 12 large metropolitan areas to mount promotional campaigns in their cities; they mailed specially prepared materials to magazines, newspapers, and other media; they produced a nationally telecast simultaneous press conference, using excerpts from the show; and they

began a special monthly newsletter, sent to 5000 opinion leaders throughout the country.[6]

In a second approach, CTW launched a utilization program intended to organize viewing groups and to reinforce the instructional goals of the program. It was realized at the start that *Sesame Street*, like any program broadcast on an educational TV station, would have an uphill battle to establish a viewing audience. In many poverty areas the local educational stations were not available on home receivers, or if they were, ETV stations were so rarely watched as to have been forgotten. Paid coordinators organized viewing groups at Head Start day-care centers, nurseries, and kindergartens; thousands of volunteers went from door to door talking to mothers. Fully 10 percent ($700,000) of the first year's expenditures went for this vital function.

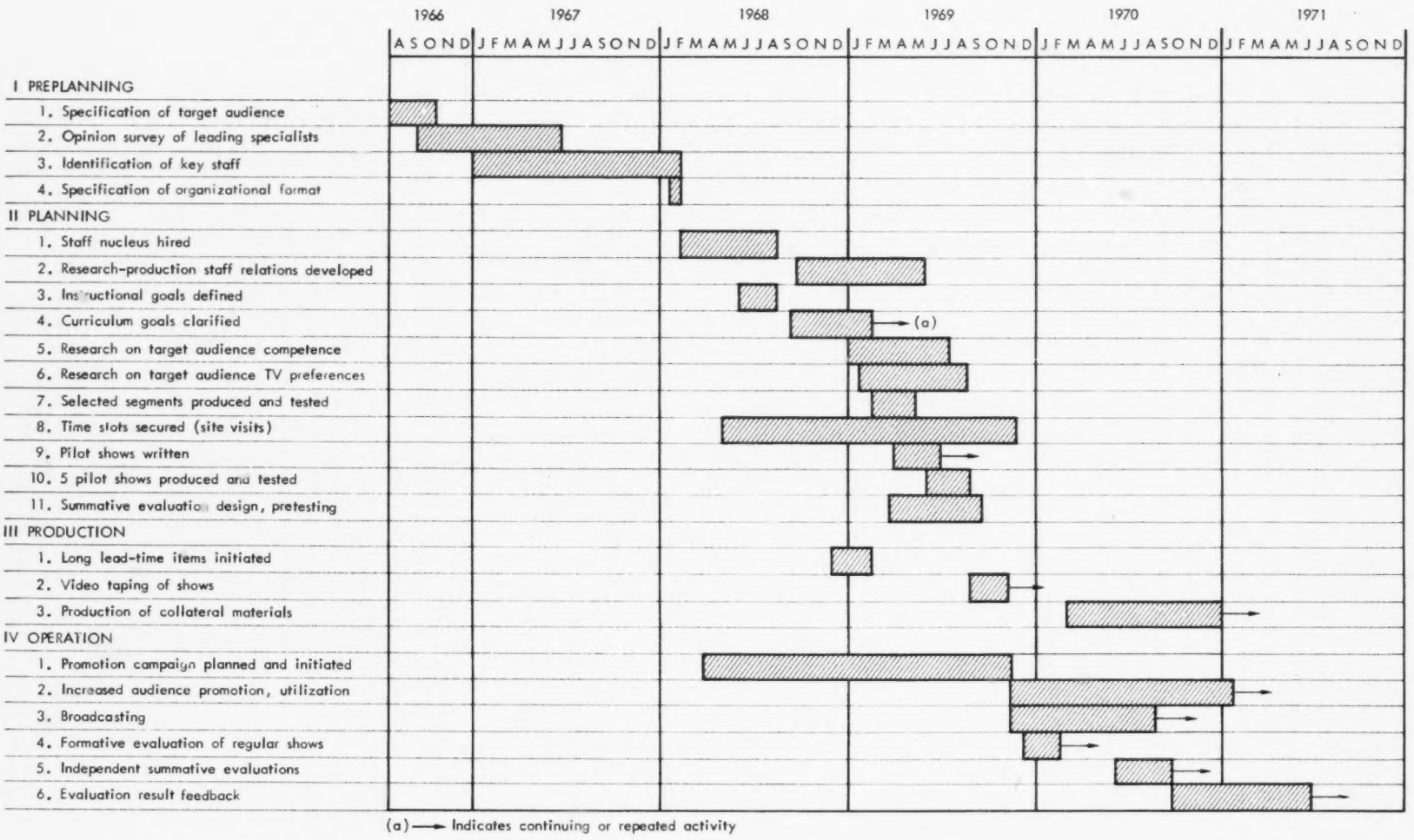
The third promotional method was to establish a CTW field-service staff in each of 14 major cities where broadbased community advisory councils and viewing centers had been created. This staff encourages the use of the *Sesame Street* magazine and similar materials by individuals and organizations, such as teachers and community volunteers, day-care nursery programs, kindergartens, parent-education programs, teenage-vocational-training programs, special programs for the retarded or handicapped, and teacher and paraprofessional training programs. Feedback to the field-services staff is channeled back to the CTW research and production staff, and thus contributes to continuous modification and refinement of show material.

Evaluation

Formative evaluation of regularly scheduled broadcast shows was begun in the early stages of the production phase. Using tests developed by the Educational Testing Service (ETS) for use in their summative evaluation study, the CTW research staff tested selected preschool children in 8 major instructional goal areas at 3-, 6-, and 12-week intervals after the program premiered. Before more than half the season's shows had been produced, the staff had received test results and interpreted them to the production staff, who modified and refined the remaining shows in appropriate areas. Independent summative evaluations, designed by ETS, CTW researchers, and the CTW Research Advisory Committee, were made after each of the first 2 broadcast seasons; these will continue to be made: the process is now built into the CTW model.

A comprehensive evaluation of the program's effect was conducted in each instructional goal area, using various target-audience categories. Tied closely to objectives and to curriculum, the tests did not attempt to examine general transfer effects, such as changes in IQ. *Sesame Street's* development and production sequence is summarized in Fig. 5.

[6] Making use of the same techniques in its promotional campaign for the second reading show, *The Electric Company*, CTW arranged a preview of the show on commercial time; made a newsletter and guide to the show available for teachers through subscription; and mailed a paperback explaining the show and the curriculum to every second-, third-, and fourth-grade teacher in the country.


1966
1967
1968
1969
1970
1971
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I PREPLANNING
1. Specification of target audience
2. Opinion survey of leading specialists
3. Identification of key staff
4. Specification of organizational format
II PLANNING
1. Staff nucleus hired
2. Research-production staff relations developed
3. Instructional goals defined
4. Curriculum goals clarified
5. Research on target audience competence
6. Research on target audience TV preferences
7. Selected segments produced and tested
8. Time slots secured (site visits)
9. Pilot shows written
10. 5 pilot shows produced and tested
11. Summative evaluation design, pretesting
III PRODUCTION
1. Long lead-time items initiated
2. Video taping of shows
3. Production of collateral materials
IV OPERATION
1. Promotion campaign planned and initiated
2. Increased audience promotion, utilization
3. Broadcasting
4. Formative evaluation of regular shows
5. Independent summative evaluations
6. Evaluation result feedback
(a)
(a) ⟶ Indicates continuing or repeated activity

Fig. 5—Developmental and operational activities: *Sesame Street*

DEVELOPMENTAL BUDGET AND COSTS

CTW spent about $7.2 million from the spring of 1968 to the completion of one full season of broadcasting in June 1970. That money was expended approximately as shown in Table 4. The budget for CTW's following year closely approximated the totals and breakdown summarized above. There were some shifts in internal priorities: for example, field services were heavily funded, the department handling non-broadcast materials was expanded significantly as revenues from the sale of products (their only source of funds) made this possible; research expenditures dropped slightly; increases in some areas reflected rising costs; and substantial resources were devoted to development of the new reading show, *The Electric Company.*

Table 4

SUMMARY OF CTW BROADCAST DIVISION EXPENSES, 1968-1970

(Thousands of dollars)

Allocation	1968-69 Season Start-up		130 *Sesame Street* Programs		
	Actual Cost	Percent of Total	Actual Cost	Percent of Total	Cost per Program
Direct and indirect program costs	974.9	57.2	3626.4	66.5	27.9
Research and evaluation	176.3	10.3	429.3	7.9	3.3
Total program costs	1151.2	67.5	4055.7	74.4	31.2
Community relations	70.5	4.2	592.1	10.9	---
Public information	99.7	5.8	290.7	5.3	---
Corporate services	383.4	22.5	509.9	9.4	---
Total broadcast division cost	1704.8	100.0	5448.4	100.0	---

SPECIAL CONSIDERATIONS FOR THE MODEL

The success of the CTW model may have been due in part to some additional factors that need to be mentioned, some because they are too obvious, others because they have been overlooked, and some, because they may not obtain elsewhere.

For one thing, the Workshop began operations with a clear idea of its target audience, and quickly agreed on clear and discrete educational goals. For another, the CTW staff enjoyed the benefits of strong personal leadership. Further, planning and production were relatively free of the usual production and broadcast deadlines that frequently limit the degree of preparation in a broadcasting organization. CTW organized itself to move into what could be called a "low-risk" area of television programming: that is, since there was little of value existing in the area of children's

programming, the field was relatively open, without any real competition. This programming area and subject matter were essentially noncontroversial. No one is really against the education of preschool children, and there is little responsible disagreement as to what they should be learning. These last two factors allowed the program planners to concentrate on the job at hand, instead of spending energy justifying approaches and running interference for writers and producers who had deadlines to meet.

While the factors just mentioned may be peculiar to the CTW project alone, we can generalize some others from a wide range of possible uses of broadcast television in out-of-school education. We can begin with the need for extensive formative research. This effort was partially caused by the fact that there was a very special target audience for *Sesame Street,* about whom there was insufficient information, and who were difficult to test without very careful procedures. There is no reason to believe, however, that the selection of a different target audience, different educational goals, or a different program format would necessarily reduce this requirement for an extensive preproduction research and development period.

Second, the CTW organization was built from the ground up. Given the special problems to be solved, this was the most effective approach, since no existing organization had sufficient experience with the kind of product envisioned by CTW's creators. Whether this approach would also be effective for another project with different objectives would depend largely on the goals and approaches chosen. In some cases, particularly where tight deadlines must be met, CTW management believes that only existing organizations could be utilized. In a longer time frame comparable to that faced by CTW, however, it may be that a new special-purpose organization would be preferable. Although it is undoubtedly true that the size of the viewing audience for educational television has been increased by the success of this series and by the promotional activities of the CTW staff, this does not mean that a new series on ETV could afford to assume the presence of any "built-in" audience. Any new program series would need to mount an extensive promotional campaign of its own, especially because it can probably look forward to stiff competition from established daytime television programs.

The third generalization concerns motivation. The CTW model is the only one of the three studied here in which a formal enrollment or matriculation, including a deposit of money, was not required of serious viewers before the start of a series of programs. Since viewing had to be motivated by rewards other than course credit, it required a different approach to programming. CTW has been more concerned (and has had more experience) than any other American educational television production company in the development of specialized television techniques designed both to educate and to entertain at the same time. A close study of CTW's operations and thinking would therefore probably be of value to anyone beginning a similar venture where general broadcasting is used, and where viewing is to be motivated by the entertainment value of the programs.

V. TOWARD A GENERAL MODEL: A COMPARISON

For the benefit of the prospective planner, this portion of the report compares ways in which the three different projects handled some of the activities that are essential to the success of home-based instructional systems using television. Some items need to be discussed in more detail than others, and some are considered self-explanatory. The body of the report concludes with a checklist of activities that are generally essential in the development of an instructional system using television in the home.

PREPLANNING

The lack of adequate preplanning has too often characterized the use of broadcast television for educational purpose. Of all the factors one could list under this heading, perhaps the most commonly slighted is the requirement that there be a clear and specific definition of the target population or audience to whom the project is directed, and that the characteristics of this audience be well studied and analyzed. The target population's instructional need, level of motivation, general ability, background skills, and various living and viewing habits are examples of the kind of information that can be useful to the planner.

The target audience and its instructional needs were known for both *TV College* and *Telekolleg*. Before launching *Telekolleg*, the network had made several studies and surveys to determine the extent of these needs and the degree to which they could be met through the use of television broadcast to the home. *TV College* simply began a 3-year project, offering TV courses and promoting their use, and later gathered the necessary data through actual experimental operation. The Children's Television Workshop had chosen a much larger and less clearly defined audience: all persons within a certain age group. The needs of this audience were not entirely known; it was assumed at least that whatever these needs were, they were not being met. If CTW were to produce a television series with instructional value, therefore, it would have to determine audience needs and characteristics through its own research.

Another difficult choice to be made at this early stage concerns simple versus complex production techniques; cost per production minute can vary so widely that it is not possible to estimate the amount of funds needed before this decision is made. *TV College* elected to transfer what were essentially classroom lectures to the television screen. *Telekolleg* chose to incorporate somewhat more elaborate production techniques; their cost at the outset was almost twice as much per program minute. *Sesame Street* decided to use professional entertainers, elaborate studio production, high-cost film animation, and professional writing and production; its costs per program minute were 15 times as much as those of *TV College*. The difference, of course, reflects the high cost of quality entertainment in American TV production. To justify its high cost, *Sesame Street* required an audience of millions. Under "A Comparison of Costs," later in this section, these differences will be further discussed.

PLANNING

The more complex the production and the more extensive the project, the longer the planning period must be. In the case of *TV College*, all elements of planning were accomplished within a 3-month period by the equivalent of some 15 persons. Of these, 12 were college instructors formed into 4 teaching teams of 3 persons each. The 4 teams needed only 8 weeks to prepare the 4 initial program series. The *Telekolleg* planning tasks, however, required a full year; they were begun by a staff of 4, which increased to some 120 persons during the program writing phase. *Sesame Street* planning by CTW took 18 months of work from the date of the first staff hiring to the first videotaping of the final program product. During this period the number of staff members grew from 20 or 30 people to nearly 200.

Neither *Telekolleg* nor *Sesame Street* producers reported that it was necessary to train staff formally in any area; persons with professional TV background and the appropriate skills were sought, and found to be available. *TV College*, however, having decided to use regular classroom lecturers, was faced with the necessity of adapting their presentation techniques to the television medium. To assist in this process, the producers made kinescope recordings (videotape was not yet generally available) of each instructor's performance, by which the teacher could observe himself in action. This procedure was a forerunner of a teaching method, widely used today in teacher-training institutions, called "micro-teaching."

Instructional Design

The process of instructional design is usually understood to include the following: (1) the formulation of a curriculum, that is, *what* is to be taught; (2) the choice of optimum methods and media, that is, *how* it is to be taught; and (3) the selection of the best means for determining if the intended learning has taken place.

It must be noted that *Sesame Street*, which was not part of a formal instruc-

tional system at all, devoted far more thought, effort, and professional resources to the formulation of curriculum than did either of the other projects. This occurred primarily because CTW was undertaking something quite new. The credit-course projects, on the other hand, both undertook to teach existing curricula. This was particularly true of *Telekolleg,* because the objective was to prepare students to pass an existing examination.

The academic tradition of higher education, which *TV College* followed, generally leaves both the details of curriculum and the choice of means of instruction in the hands of individual teachers. During their first year, *TV College* attempted to team three teachers together for the planning of each course, but these people were not used to working in teams, and it was soon found that more could be accomplished faster by a single instructor working alone, doing things his way without the necessity of conflict and compromise.

Telekolleg instruction was prepared by writing teams, each working under the direction and coordination of an editor. As with the professional TV production staff of *Sesame Street,* years of experience working on creative teams made it no problem for them to work together in this way. Both *Telekolleg* and *Sesame Street* used advisory committees, *Telekolleg* mostly for overall policy matters, while *Sesame Street* called frequently on their advisors for the evaluation of proposed teaching methods and production techniques.

In the design of evaluation, described in detail in other sections of this report, *TV College,* in traditional academic fashion, depended on the instructor of a course to prepare his own examinations and, with help, to grade his own students. *Telekolleg* left all of this to the existing machinery of the state's Ministry of Education in its administration of the *Mittlere Reife.* Since *Sesame Street* was informal instruction, learners were not formally examined, but much research effort went into pre- and post-testing of sample groups.

At *TV College,* an instructor who prepared and presented a television course began by preparing a Teleclass Study Guide of 30 to 100 pages in length (about 1 to 30 pages per lesson), that integrated the TV instruction with the text and the collateral readings; he also designed student assignments. In the *Telekolleg* instruction, some 6000 pages of printed materials were prepared by writers associated with the broadcasting staff. Constituting the course's textual material, these documents averaged about 13 pages per television lesson. CTW also prepared various printed materials which were intended for promotion as well as for direct instruction; *Sesame Street's* intention, however, was to achieve its instructional purpose primarily via the television programs themselves.

Both Chicago's *TV College* and Bavaria's *Telekolleg* relied heavily on instructional media other than television in their systems, using such tools as supplementary printed materials, seminar meetings among students, direct contacts with faculty, texts, and examinations. In general, it can be said that additional instructional elements are always used, often extensively, with direct instructional TV programs, but rarely with general-interest TV educational programs.

Scheduling

It is important to note that in each of these three projects, planners placed considerable emphasis on obtaining appropriate air time and time for program repetition. *TV College* programs are always broadcast twice, once during daytime hours for homemakers, and once during evening time for those who are employed outside the home. *Telekolleg* programs are broadcast on the general entertainment channel in the early evening (between 6:00 p.m. and 9:15 p.m.). Each program is repeated at a different time on the following evening or shortly thereafter, often on one of the other two broadcast channels for the benefit of viewers who cannot receive the first channel clearly.

Repetition is one of the principles on which *Sesame Street's* informal instruction is based. Some items are repeated within a given program; many are repeated from one program to the next. Repetition of entire *Sesame Street* programs is encouraged by granting stations unlimited broadcast rights. Some stations have taken advantage of this to air each program several times, knowing that each broadcast will garner a high rating, probably from many of the same viewers.

PROMOTION

A carefully prepared and timed "promotional" campaign is needed to inform the target audience of the date, time, and channel of the broadcast programs, and in the case of credit courses, how to enroll and obtain the printed materials. This campaign is particularly important when, as in the case of *Sesame Street* and *TV College,* educational TV channels are to be used—channels which few families habitually watch.

Such promotional activity can be thought of as "marketing." Market strategy must analyze target-audience characteristics, including its TV-viewing, reading, and radio-listening habits; then plan a marketing campaign, by means of some or all of the following activities: (1) direct advertising by television, press, and radio; (2) cooperation of community leaders, local, state, or federal agencies; (3) a media public-relations effort, including such activities as participation in radio and TV interview shows and supplying information to columnists; (4) direct mail approaches; (5) special grass-roots campaigns and personal contacts. *Sesame Street* and *Telekolleg* used all of these methods, while *TV College* focused mostly on direct mailing and media public relations.

The promotional activities and the public-relations effort must peak about the time the program goes on the air. To accomplish this, producers need an intensive effort for a short time—no easy task, because of the difficulty in recruiting a competent public-relations staff for a short time. It may sometimes be necessary to use CTW's solution: contract the public relations to a professional firm that offers a number of different media specialists.

PRODUCTION

When live TV is involved, as it was in *TV College* between 1956 and 1968, the production of programs must be simultaneous with their distribution, and, in such a case, program production would be included in the operations phase. In the case of extensive production such as *Telekolleg,* where 468 programs were eventually recorded on videotape, operations may start well before production is completed. The advantage of this procedure is that feedback of evaluation on the use of early programs may be used to make improvements in later production. In any case, there is still a requirement for a certain amount of ongoing production as part of the operations phase, that is, for revision, replacement, or expansion of scheduled offerings.

Sesame Street programs were, of course, all produced in color; those of *TV College* were also, after the local ETV station converted to color. *Telekolleg,* however, at the time of this study, produced only its science programs in color, because the number of color TV sets in Bavaria was too small to justify more extensive use of color. It was evidently assumed that science programs need color more than do other subjects, a view with which most educators would agree, although researchers have found scanty evidence to support this theory.

What is considered appropriate in style and complexity of production techniques will vary substantially, depending on whether the program uses direct instruction, is tied to an established degree-granting or skill-training system, and has a motivated target audience; or whether it is intended for general viewing, competing with entertainment TV programming to attract audience attention. The latter condition motivated *Sesame Street's* emphasis on professional techniques of commercial entertainment.

OPERATIONS

Very important activities in the operation of any instructional system using television (or communication media of any class, for that matter) are the organization of viewers and viewing groups, and the maintenance of constant direct contact with the learner population. Without this, an instructional "service" may exist, such as the audio-visual service in a school, but it certainly could not be called an instructional system.

Instructional television has too often consisted merely of programs that were broadcast just as entertainment shows are, in the hope that they would be of general interest to home viewers, or of supplementary value to teachers in their classes.

In both *TV College* and *Telekolleg* programs, each home participant was contacted directly, first when he enrolled in the program or paid his fee, and later in the regular group meetings and personal counseling. Even *Sesame Street,* while not dedicated to formal instruction as were the other two projects, devoted considerable resources to alerting and organizing the viewer population. This procedure is believed to have been extremely important to the success of all three projects.

Unlike *TV College* and *Telekolleg, Sesame Street's* target audience was distributed throughout a large nation, but the bull's-eye on this target was the culturally deprived child of the inner city. To contact these viewers directly, CTW exerted particular effort, establishing local field services, organizing viewing groups, and contacting mothers personally. Again, this effort to organize and ensure a viewing audience must receive much credit for the rapid growth of *Sesame Street's* popularity.

In the audience participation of their programs, both *TV College* and *Telekolleg* had to contend with what appeared to be a significant dropout factor. Dropouts for *TV College* were almost 40 percent of the enrollees in the first semester, but averaged 25 percent each semester over a 9-year period. A comparative figure for *Telekolleg* is 27 percent. Comparison is a little difficult here, however, because *TV College* figures are released semester by semester. (If, for instance, *TV College* continued to lose 25 percent of its original enrollees each semester for two semesters, it would end up with only 56 percent of the original people.) *TV College* operated for most students as a series of courses, with only a few using it to obtain a 2-year junior college degree (less than 1 percent); individual enrollees, therefore, were not followed for more than a semester at a time.

At the start of *Telekolleg,* 11,044 persons enrolled, paying DM25 (about $5). Of these, 77 percent (8,500) came to the first Kollegtage meetings given in 136 Bavarian towns. After 3 months this number had dwindled to an industrious 5,000, where it remained until late in the first year. At the end of the year, 3,700 took the intermediate examination.

These dropout figures must be interpreted, of course, because there are other factors involved. One of these is the possibility of overpromotion. The *Telekolleg* campaign evidently reached a large proportion of the population and convinced many people to enroll who had neither the level of motivation nor the time to carry through the months of hard work that the project required. It is likely that an even more intensive and persuasive campaign might have resulted in a still higher level of enrollment, but a higher subsequent dropout rate as well.

The 3,000 students who sat for the *Mittlere Reife* at the end of the last 2-year period can be interpreted as 27 percent of the 11,044 enrollees who originally signed up and paid their money, or as 35 percent of the 9,500 who appeared at the first *Kollegtage* and actually started the course, or, if you wish, as 60 percent of the steady 5,000 who continued after the first 3-month period. The fact is that, even with the dropouts, sufficient numbers of learners were served at a low-enough cost per successful learner to ensure the enthusiastic continuance of the program.

EVALUATION

An important part of operations that must be adequately planned in advance is an ongoing evaluation program. This function provides the program administrators and the producers of the media materials with continuous knowledge of the

effectiveness of the program in meeting its objectives. Evaluation can vary widely in nature and extent of effort. It was used by all three projects, but for different purposes.

There are two types of evaluation: (1) formative evaluation, aimed at improving the program effectiveness during the development and early operational stages; and (2) summative evaluation, aimed at measuring the effectiveness of the project after its completion in terms of its success in achieving its objectives. When a program is breaking new ground, with a new target audience, new objectives or methods, as did *Sesame Street,* elaborate formative evaluative mechanisms are needed, particularly if the program is important for public policy, or is very costly to develop or operate, or some combination of these. Simpler methods are appropriate when the producers can call on a body of existing procedure and knowledge, as could *TV College.*

TV College began its history with a 3-year experimental period during which extensive comparative studies were made between TV students and control-class students taught by conventional methods. These studies aimed at detecting differences if any, in cost, acceptance, and learning achievement. But this kind of comparative research, much practiced during the decade of the 1950s, had little if anything to contribute to questions about improving the system and cannot therefore be considered formative. What formative evaluation was done at *TV College* was largely informal and unreported, since course content was left entirely in the hands of the instructors—the conventional procedure in higher education. The major sources of formative data undoubtedly were the instructors' personal contacts with students and the results of midterm and final examinations—again the standard academic procedures.

Several formative uses of early evaluation were reported in the research on *Telekolleg,* especially after the end of the first series of courses. From this research, improvements were made in the printed materials, the TV programs, and the *Kollegtage. Telekolleg* producers were able to form a detailed picture of the student population, particularly valuable because the target audience differed in some respects from what the research and production staff expected to find.

In the *Sesame Street* model, five pilot programs were produced and tested to accomplish formative evaluation. The reaction of audiences in a real-life viewing situation, complete with outside distractions, played an important part in shaping final CTW production decisions.

Both *Telekolleg* and *Sesame Street* devoted substantial resources to the evaluation of audience characteristics, learning achievement, and the like. During the first year at least, the number of programs prepared in advance for both these models was kept as low as possible so that productions could respond quickly to evaluative information. *Telekolleg* had 130 programs taped when broadcasting began; *Sesame Street* had less than 25. *TV College* had none because all production was simultaneous with transmission, that is, lessons were broadcast live. For the 3 years of operation that it has used videotape, *TV College* has adopted the procedure of recording an entire course, all 30 programs, during the semester before the term in which it will be shown.

Constant program monitoring of all activities will be required for efficient management of operations, whether evaluational studies have been done in the development phases or not. During operations, summative evaluation may range from mail responses (postcards or letters), through questionnaires, to detailed studies of the viewers' cognitive or affective changes. Like formative evaluation, summative evaluation can only be effective when it is conducted using staff or methods that gain the confidence of management. Too often summative evaluations are so presented that management considers them irrelevant or too complicated for use. In order to avoid such outcomes, close working relations need to be established between production staffs and the independent evaluators who conduct the summative evaluations, so that each party can understand the other's approach. Although this method can lead to charges that evaluators' and producers' relations are too close for objectivity, such a danger is probably less serious, given good judgment on both sides, than the danger that the summative evaluation, while objective, remains disregarded by the producers.

CTW's summative evaluation investigated not only how people's knowledge or behavior changed as a result of the program, but also less palpable issues: What did people think about the program? What were the characteristics of viewers and nonviewers? How successful were the marketing and nonbroadcast efforts in their respective domains? More broadly, did the program have unanticipated effects on community attitudes: for example, if kindergartens used *Sesame Street,* did parents feel more favorably disposed toward the schools? In Bavaria, evaluators asked, if rural students gain the high-school certificate through *Telekolleg,* do they tend to migrate more readily to the cities? In Chicago, the evaluators asked, did women with children who received the *TV College* degree tend to take jobs outside the home?

A COMPARISON OF COSTS

Clear-cut costs are difficult to obtain, and when cost figures from different programs are compared that may contain different components, comparisons are often meaningless. Knowing that a meaningful comparison would require a far more detailed study than time on this project allowed, and far more cost data than the amount originally collected, the author is still of the opinion that some rough relationships, even if inaccurate, will be helpful in understanding the differences between the three projects.

Annual operating funds for each of the projects studied were roughly as follows:

TV College (1963-1964 budget)	$538,000
Telekolleg (average over first 4 years)	$1,200,000
Sesame Street (first year total cost)	$7,153,000

Each program offered a different number of programs annually, and devoted a different proportion of its budget to program production.

TV Program Production Cost

TV College probably devoted 85 percent, or $457,000, of the 1963-64 budget (probably fairly typical of later years) to TV-program items, such as studio and transmission costs, coordination, videotape stock, and the TV-faculty portion of the instructional payroll [4, p. 123].[7] The rest was used for general administration, the preparation of printed materials, and evaluation. When divided by 300 hours of programming produced annually, the cost amounts to $1,523 a program or $34 per minute of final production.

Telekolleg devoted probably about 30 percent ($360,000) of its annual budget to the TV-program component of the *Telekolleg* instructional system. When this cost is divided by the 200 lessons produced each year, a figure of $1,800 is obtained, which may be close to the cost of TV production per program. Since each *Telekolleg* program is 30 minutes long, production may have cost approximately $60 per minute.

CTW devoted 65 percent ($4.6 million) of its first year's expenditure to the creation and production of what was seen on the air. The balance was spent on preproduction research and postbroadcast studies (8 percent), promotion (5 percent), administration (10 percent), and utilization (10 percent). With this sum, CTW produced and distributed 130 hour-long programs. Costs amounted to between $31,000 and $35,000 a program, or $520 to $590 a minute of final production. Since these figures were obtained from sketchy and poorly identified cost information, they should be used only to provide a rough comparison of the complexity of production involved in each case.

Cost Per Viewer

A second cost comparison, again only rough and approximate, can be made between these three programs on a cost-per-viewer basis. Both *TV College* and *Telekolleg* had three kinds of viewers: credit students, noncredit students, and general-interest viewers. *Sesame Street,* of course, had viewers only of the last category. The TV courses offered for credit justified their costs against credit students only; in the case of *Telekolleg,* graduating credit students only. These comparisons point to a wide difference between formal instruction and general informal viewing, relative to what is considered justifiable per capita cost. The range in costs, as shown in Table 5, is between $0.004 per viewer *(Sesame Street's* high-audience estimate) and $3.75 *(TV College's* current cost per credit student). This is a difference ratio of nearly 1:1000. Formal instruction and general viewing are thus two quite different uses of television. They have sometimes been distinguished by calling the more specific use of TV "narrowcasting" as opposed to the more general "broadcasting."

The viewing costs of *Sesame Street* are comparable to the per capita costs that

[7] TV costs are assumed to include the following items: studio (and transmission), $227,000; TV instructors (90 percent of instructional cost), $147,480; clerical staff (80 percent of staff clerks), $64,000; coordination (90 percent), $11,710; videotape, $6,484. Total = $457,000.

Table 5

COST COMPARISONS OF THREE TELEVISION MODELS

Item No.	Item	I: *TV College*		II: *Telekolleg*		III: *Sesame Street*		Ratio (I):(III)
		1963-64	1972-73	1969	1971	High Estimate	Low Estimate	
1	Annual overall budget ($)	538,000	875,000	1,200,000	1,750,000	7,000,000	7,000,000	1:13
2	Annual TV program production budget ($)	457,000	885,000	360,000	525,000	4,600,000	4,055,000	1:13
	Annual number of TV programs:							
3	Different programs produced (including updating)	300	300	200	200	130	130	2.3:1
4	Different programs distributed (broadcast)	525	540	350	350	130	130	4:1
5	Total programs broadcast (includes repeats)	1,050	1,080	1,050	1,050	260	260	4:1
	Annual number of registrations:							
6	Course	9,700	8,540	9,497	---	---	---	---
7	Credit	---	7,435	4,866	---	---	---	---
8	Noncredit	---	1,106	4,631	---	---	---	---
	Estimated total average audience for each program (includes repeats):							
9	Credit students	404	437	2,366[a]	---	---	---	---
10	All students (credit + noncredit)	713	502	2,883	---	---	---	---
11	All viewers (credit + noncredit + casual)	30,000	30,000	150,000	---	8,000,000	3,000,000	1:23
12	Average program length (minutes)	45	45	30	30	60	60	---
13	Overall instructional cost per course registration (in dollars)	55	105	126	---	---	---	---
	Estimated program cost:							
14	Per produced program (assuming no distribution cost) (2/3)[b]	1,523	2,950	1,800	2,625	35,400	31,200	1:23
15	Per minute of produced program	34	65	60	87	590	520	1:15
16	Per distributed program (2/4)	870	1,639	1,029	1,500	35,400	31,200	1:41
17	Per broadcast (2/5)	435	819	34?	500	17,692	15,596	1:41
	Estimated cost per produced program:							
18	Per credit student (14/9)	3.76	6.75	0.76	---	---	---	---
19	Per student (credit + noncredit) (14/10)	2.13	5.87	0.62	---	---	---	---
20	Per viewer (credit + noncredit + casual)	0.05	0.10	0.01	---	0.004	0.01	25:1
	Estimated cost per distributed program:							
21	Per credit student (16/9)	2.15	3.75	0.45	---	---	---	---
22	Per student (credit + noncredit) (16/10)	1.22	3.26	0.38	---	---	---	---
23	Per viewer (credit + noncredit + casual) (16/11)	0.03	0.05	0.01	---	0.004	0.01	15:1
	Estimated cost per broadcast program:							
24	Per credit student (17/9)	1.07	1.87	0.14	---	---	---	---
25	Per student (credit + noncredit) (17/10)	0.61	1.63	0.12	---	---	---	---
26	Per viewer (credit + noncredit + casual) (17/11)	0.01	0.03	0.002	---	0.002	0.005	15:1
	Ratio between highest cost per credit student and lowest cost per general viewer:							
27	Per produced program (6.75: 0.004)							1687:1
28	Per distributed program (3.75: 0.004)							937:1
29	Per broadcast program (1.87/ 0.002)							935:1

[a] Calculated by method given in Table 6.

[b] Numbers in parentheses following items indicate method of calculation, e.g., 2/3 indicates Item No. 2 divided by Item No. 3.

advertisers will pay (on a cost-per-thousand-viewer basis) to reach a similar viewer population. National advertisers will spend $2.50 per thousand viewers on something with general appeal. When the audience is narrowed or specialized by virtue of programming that appeals to a particular age group, for instance, advertisers feel justified in spending $7.50 per thousand viewers. This amounts to between one-quarter ($0.0025) and three-quarters ($0.0075) of a cent per viewer. To compare our instructional programs with these figures, we must consider only the costs of the television components, not the overall budgets. *Telekolleg's* cost per viewer was in the advertiser's range ("viewer" includes all who watch an average program whether credit student, noncredit student, or casual viewer); *Sesame Street's* cost was slightly higher. The *TV College* cost per general viewer was 5 to 10 times what an advertiser would pay (its cost per credit student was close to 1000 times the advertising standard). This does not mean that *TV College* was too expensive (except to an advertiser), but only that it could not be justified as a general audience program, which of course it was not intended to be.

Meaningful Cost Comparisons

The problem of generating meaningful cost comparisons was compounded by the fact that all of the study's TV program cost data lumped studio and production costs together with broadcast transmission costs. Both *TV College* and *Telekolleg* transmitted more programs each year than they produced; many were repeated from previous years and each program was broadcast two or three times.

The cost relationships shown in Table 5 include the cost (1) per produced program, (2) per distributed program, and (3) per broadcast program. The method of derivation for these numbers is given in Table 6. Since the basic overall television component cost from which each of these three costs is derived is the same (that is, it includes both production and broadcast costs in the same figure), they can have but little specific meaning. The same must be said, of course, for the costs per credit student, per student, and per viewer, which are further derivations from the same data. The purpose of these figures is simply to provide a rough means of comparing the costs of the three projects.

The only legitimate cost comparison that can be made for the two college programs, *TV College* and *Telekolleg*, is to compare the cost per TV credit student with the costs of conventional instruction in the same subjects. *TV College* currently estimates the cost of educating an average student in the City Colleges of Chicago to be $50 per credit hour; the cost of *TV College* is estimated to run about $42 per credit hour, or 84 percent of the cost of the conventional school.

Telekolleg estimates that a secondary school education costs the Bavarian government about DM2240 per year for a full-time student, whereas the same schooling via *Telekolleg* costs roughly DM434, less than 20 percent as much. This estimate was obtained by counting the cost of the whole project divided among only those *Telekolleg* students who passed the *Mittlere Reife*.

Table 6

ESTIMATED AVERAGE NUMBER OF *TELEKOLLEG* STUDENTS WATCHING ONE TV LESSON

Viewer Category	Estimated No. Matriculated	Estimated No. of Programs Seen per Year by Each Student	Total Student-Viewings per Year	No. of Students Viewing Each Different Broadcast Program[a]
Full-time credit students	3,452	208	718,010	2,051
Part-time credit students	1,414	78	110,292	315
Total credit students	4,866		828,302	2,366
Noncredit students	4,640	39	180,750	517
Total students	9,506		1,009,052	2,883

[a]This number is determined by dividing the number of student-viewings per year by the number of different programs broadcast per year (350).

CHECKLIST FOR INSTRUCTIONAL PROGRAMS USING TELEVISION AT HOME

Not all of the activities listed below were present in each of the projects studied; they did not always proceed in exactly this order, and they are not all included in the previous comparative discussions. The following list provides a logical sequence, but does not represent any of the specific programs studied. General headings and subheadings are given in outline form; all activities are indicated by bullets. Items A, B, and C have been referred to in this report as Development Phases.

A. PREPLANNING

1. Specification
   - Identify the target population (or audience) for whom the project is intended.
   - Survey or poll to determine the need for the proposed service, and substantiate the need with empirical evidence. (Some special funding may be required for this.)
   - Express the general goals of the project.

2. Estimation
   - Establish desired quality and/or complexity level of TV-program printed materials and other media software production.
   - Estimate categories, caliber, and number of personnel.
   - Estimate costs and other resources required.

3. Resource identification
   - Choose key staff members, consultants, and consulting organizations.
   - Explore the possibilities of liaison and cooperation with community organizations with similar goals or serving similar target populations.

4. Fund-raising
   - Identify possible sources of funding and contact these to determine the best approach to each.
   - Prepare and submit proposal(s) for funding. (Some earlier funding may have been required to support the preliminary research.)

B. PLANNING

1. Assembly and deployment of resources
   - Hire staff; choose consultants.
   - Organize central staff (administration, media production, evaluation, etc.).
   - Organize field staff (TV viewing and utilization).
   - Train personnel, if needed: production staff, evaluation staff, utilization staff.
   - Establish close liaison with target community institutions: groups or organizations who will cooperate in organizing the target population, promoting, and implementing the project.
   - Establish relationships with production organizations, studios, supply houses, outside personnel.

2. Instruction design
   - Design the instructional curriculum; specify learning objectives, in behavioral terms when possible.
   - Design the overall instructional system: establish the appropriate mix of TV programs, group meetings, student experience, counseling, etc.
   - Plan media materials (TV programs, printed materials, etc.).

3. Budgeting and scheduling
   - Establish resource requirements, allocate resources.
   - Schedule the production of media software (materials).
   - Schedule program transmissions, group meetings, etc.
   - Plan and schedule the distribution of recorded materials.

4. Evaluation
   - Plan the summative evaluation procedure, including the planning of pretests, for baseline data.
   - Design the ongoing monitoring system for collecting data on learning progress, acceptability, efficiency, and the like.
   - Design the formative evaluation strategy.
   - Design a system for feedback of research results to producers and administrators.

5. Promotion
   - Further analyze the target audience—plan techniques for reaching them and persuading them to participate.

- Plan the promotion and marketing strategy.
- Release initial publicity and operate the promotion campaign.

6. Pilot-testing
   - Write, produce, test, and revise pilot TV programs.
   - Prepare drafts of printed materials, test, and revise. (Same for other media.)

C. PRODUCTION

1. Program software
   - Prepare, rehearse, and record television or film lessons or programs. ("Prepare" includes script-writing when appropriate.)

2. Other media software
   - Prepare and produce audio tapes or materials.
   - Prepare and produce printed materials.

D. OPERATIONS

1. Ongoing promotion and publicity
   - Publish and distribute program schedules

2. Delivery
   - Distribute supplementary materials.
   - Transmit TV programs.

3. Implementation of instruction
   - Matriculate participants, provide initial counseling and the like.
   - Maintain liaison with target institutions.
   - Operate group meetings, classroom activities, if any.
   - Operate personal counseling component, in person and/or by telephone.
   - Correct student assignments.
   - Administer and grade tests and examinations.

4. Production
   - Produce lessons or programs for revision, replacement, or expansion of scheduled offerings.

5. Evaluation
   - Pretest learners as a base for summative evaluation.
   - Monitor program transmissions.
   - Evaluate program effectiveness, monitor learning process.
   - Maintain ongoing cost accounting.
   - Evaluate system efficiency.

- Feed back information to producers for formative purposes.
- Carry out summative evaluation research at the end of project, end of season, or other appropriate time.

Appendix

FURTHER CHARACTERISTICS OF THE *TELEKOLLEG* EDUCATIONAL PROGRAM

CURRICULUM

The *Telekolleg* curriculum includes 14 courses as shown in Table 7. The 8 basic courses are grouped into 5 series of 78 lessons each. The remaining 6 special courses add up to another 78 lessons, for a total of 468 lessons in all. Of the 14 courses, 10 are required of candidates for the *Mittlere Reife;* 4 others are elective, and are usually taken by students with plans for entering an advanced technical school.

This is basically the existing curriculum of the *Berufsaufbauschule,* of which there are 92 in the state of Bavaria. These schools are one of several kinds of vocational-training institutions that provide the nonacademic Bavarian youth with various routes toward increased skills and usefulness in German industry. The learner may qualify for entrance into advanced trade schools within 3 years: 2 years of evening school and 1 year of full-time day attendance. This allows the student to maintain full-time employment, if necessary, for the larger part of the time. Its aim is clearly defined and well understood by the people.

The final examination of the *Berufsaufbauschule* taken at the end of 10, 11, or 12 years of school, depending on the particular educational route, is called the *Fachschulreife* (trade or technical school examination). Passing this examination qualifies the student to proceed to higher technical schools for 3 to 5 years more career education. For this reason it is also called the middle exam or *Mittlere Reife.* It is this state-administered final examination that *Telekolleg* is designed to train the student to pass, without his actually attending a vocational school.

The Bavarian educational structure, with its many kinds of secondary schools and educational paths, is very complex by our standards. Figure 6 is a simplified chart showing the flexibility allowed in changing paths. The *Mittlere Reife* (or its equivalent) is shown in the several places where it is encountered, leading to the various subsequent educational opportunities for which the learner is eligible if he successfully passes.

Table 7

TELEKOLLEG CURRICULUM

	Basic Subjects	No. of Lessons	Required or Elective
1	German	R	78
2	English	R	78
3	Math (Algebra, Geometry)	R	78
4	History	R	52
	Supplemented by:		
5	Economic Geography		13
6	Social Science		13
			78
7	Physics	R	65
	Supplemented by:		
8	Chemistry		13
			78
	Subtotal		390
	Special Additional Courses		
9	Biology	R	13
10	Technical Drawing	E	26
11	Economics and Business Management	R	13
12	Electrical Engineering	E	13
13	Chemical Engineering	E	5
14	Bookkeeping	E	8
	Subtotal		78
	Grand Total		468

TARGET POPULATION CHARACTERISTICS

While some students devote full time to their *Telekolleg* courses, most of them are simultaneously employed. Hence, *Telekolleg* lessons are broadcast during evening hours. Each student is expected to spend at least 1 hour a day on each of his courses, a heavy schedule for a student taking 3 or 4 courses. Where students have been unsuccessful in their courses, it is generally considered to be due to lack of sufficient study. If a student takes 3 or 4 courses at a time, he may finish within 2 years. Many students take 3 or 4 years; some will repeat courses when in their estimation they are not yet ready for the examination. Taking a course a second time costs them little extra, since they have already purchased the printed materials.

The entire curriculum is presented in a 2-year cycle. Thus, a student may enter the program only every second year. To decrease the cycle to 1 year, twice as many lessons would have to be broadcast in any given time. More broadcast time would involve the reduction of other broadcast services, and at present the demand for *Telekolleg* is not considered great enough to justify withdrawing programs important to much greater numbers of viewers. Broadcast time can be very tight where only three channels exist for all broadcast television services.

Multi-media materials are so designed that the TV lessons take the lead, to be supplemented by the printed materials. This is the opposite approach to that taken

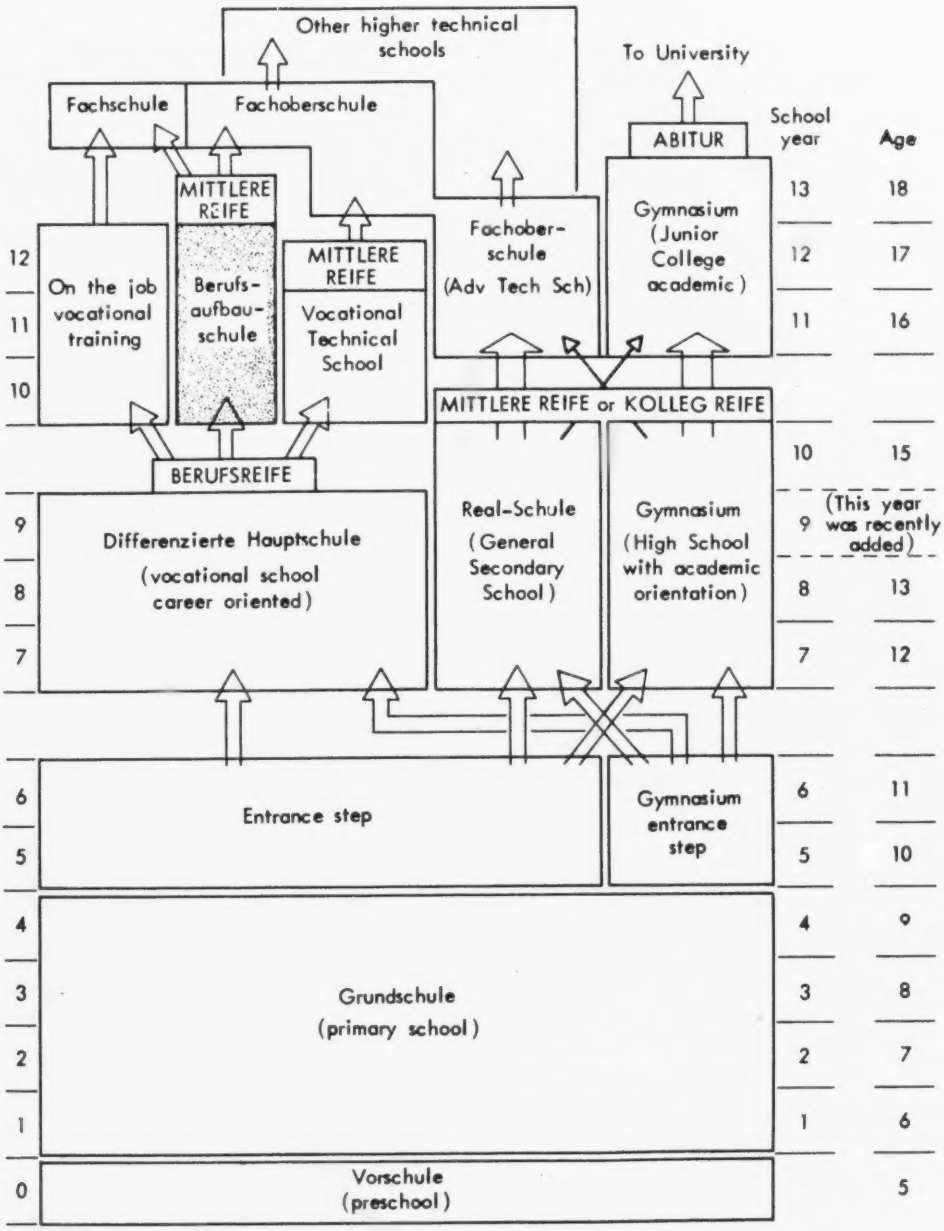

Fig. 6—Structure of the Bavarian educational system

by the British Open University, where the printed materials are considered primary and the TV programs play a secondary role. The British theory is that more time is spent studying the printed materials and they are always available, whereas TV programs are evanescent and occasionally missed entirely. *Telekolleg* producers, because they have a different kind of student, have chosen to emphasize the visual medium, expecting it to have a greater appeal and motivational effect on the nonacademic *Telekolleg* student.

The daily TV programming of *Telekolleg* subjects for a typical trimester (April-July 1971) is given in Table 8.

Women in the Target Population

Among those students who were candidates for the *Mittlere Reife*, 21 percent in the first *Telekolleg* series were women; later, the percentage dropped to 17. Among candidates for individual course credit only, the percentage of women was 38 at the outset and dropped to 33 percent. The noncredit student group had the highest percentage of women, starting at 43 percent and dropping to 39. This suggests that women were more interested in general education than in certification. We do not know why the general percentage of women participants tended to drop off a few percentage points as *Telekolleg* proceeded into the second and third course of study.

It had been expected that a large number of women, confined to the home, would see in *Telekolleg* an opportunity to improve their general education, and that the female population might even exceed the male among the participants. Although this assumption seemed logical, the number of women participants was far smaller

Table 8

DAILY TV VIEWING SCHEDULE FOR *TELEKOLLEG*

(April-July Trimester 1971)

Time (p.m.)	Day of the Week						
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
6:00						German (repeat)	German (repeat)
6:30	History	English	Biology	Tech. Drawing (repeat)	Physics	History	Physics
7:00	English	Math.	Tech. Drawing	German			Tech. Drawing
7:30				Math. (repeat)			
8:15	English (repeat)						
8:45	History (repeat)						

than expected—only 21 percent of the student population. The percentage of women enrolled in *Telekolleg,* however, is very close to the percentage of women in the regular secondary evening schools and vocational schools. Women constitute about 22 percent in the *Berufsaufbauschule,* secondary-level vocational schools usually attended by young people in their 10th, 11th, and 12th years of education. In the *Abendgymnasium* (evening secondary school, academically oriented, years 7-10), their percentage is about 20. In the third type of secondary school, the *Abendrealschule* (a combination of academic and vocation orientation), slightly more than 17 percent of the enrollees are women. Women constitute about 24 percent of college students in Bavaria. The percentage of women participating in *Telekolleg* is thus approximately the same as those taking part in any of the types of conventional adult education in the evening school programs.

Evaluators of *Telekolleg* suggested several reasons for the small number of women participants: women disliked taking examinations; they preferred to use the TV classes to add to their general knowledge, choosing English, History, and German. They do not need the courses to prepare for a vocation, and those *Telekolleg* offered were not oriented to the typical professions for women. Women of certain social classes consider their vocational careers only transitional, and marriage and childrearing to be their real vocations; further vocational training would not be useful for married and family life. Evaluators felt that it would take more than the offer of new educational courses to modify this traditional viewpoint.

Family Size

The presence of children in the home was found to be inversely related to *Telekolleg* participation, especially among those who were preparing for the *Mittlere Reife* (Group A). Of these, 63 percent had no children, another 20 percent had only 1 child, and less than 17 percent had 2 or more. These figures apply to both men and women; it can be assumed that the percentages would be even more extreme if they concerned women alone. Group A was defined as those planning to take the *Mittlere Reife;* Group B, those taking courses and doing the work with no intention of taking the *Mittlere Reife.* Group C participants purchased materials and followed lessons without taking any of the class examinations. Home situations of each group are summarized in Table 9.

Whether these differences are due to a greater motivation on the part of childless people, or whether motivation is the same but the presence of a family interferes with participation, cannot be determined from available evidence. Possibly both factors contribute.

An interesting relationship was observed between married participants and the professional activity and educational background of the marriage partner. In about half of the cases, both husband and wife worked, a percentage that is much higher than that in the general population. In these cases there may have been motivation for social improvement, or it may be that professionally qualified wives do not give up their vocations after marriage. When this happens, the other married partner

Table 9

FAMILY CHARACTERISTICS OF *TELEKOLLEG* STUDENTS

Characteristic	Group A (%)	Group B (%)	Group C (%)
Marital status:			
Single	49	35	29
Married	49	57	62
Widowed or divorced	2	8	9
	100	100	100
Family size:			
No children	63	47	54
One child	20	21	21
Two or more	17	22	25
	100	90	100

may try to equalize the difference in education by participation in *Telekolleg*. This situation was most obvious in Group A, but was also found in Groups B and C [7, p. 35].

ACADEMIC RESULTS

Offering a new, and for many, a much more convenient path to the *Mittlere Reife*, *Telekolleg* enrolled nearly 10,000 full participants in 1969, the third year of the project. This approximately equaled the total number of students attending the 92 *Berufsaufbauschule* put together.

There is evidence that *Telekolleg* is serving some audiences who had not been considered targets in the original planning. Parents who watch the programs have reported in large numbers that *Telekolleg* had helped make them more knowledgeable about their children's school curriculum, better able to assist children with homework, and to feel more closely related to the school. Also, many teachers are reported to be watching *Telekolleg* programs, especially the particular subjects that they teach, in order to stay up to date on the information they are handling, and to observe other teachers in action and thus improve their own teaching methods.

The fact that the original publicity for *Telekolleg* in the last 3 months of 1969 generated 30,000 responses would indicate the high level of interest in Bavaria for this type of education. This could be interpreted to mean that 3 times as many people as then attended the *Berufsaufbauschule* would like to do so, but were unable or not sufficiently motivated to overcome existing obstacles. The fact that 8,500 appeared at the first *Kollegtage* could indicate that only about one-fourth to one-third of the expressed demand for schooling was actually met by *Telekolleg*, or that only these many people were strongly enough motivated. Yet the number of *Telekolleg* stu-

dents who passed the *Mittlere Reife* effectively doubled the output of the *Berufsaufbauschule*. It would seem, therefore, that the potential number of participants for *Telekolleg* may be 5 to 10 times greater than the number who are already taking part, and the output of the *Berufsaufbauschule* could be increased many times by extending the student population of the *Telekolleg*.

The Advantages of Repeating Programs

The Bavarian network provides 3 television program services simultaneously. There are actually 3 networks *(Sendernetz);* each program is broadcast on different TV channels in different parts of the state. Educational programs are broadcast on the first and third network, and during the first few years, *Telekolleg* was carried on both. The fact that a repeat of each program was carried on an alternate channel made it possible not only for those who couldn't see one broadcast because of time conflicts, to see the other, but also assured that those who did not have clear reception on one of the channels could still view the program. Successive research studies showed 64 and later 73 percent of *Telekolleg* participants were able to receive both Channels I and III, and it is believed that a large number of them viewed each program twice. This indicates that the opportunity to see a program more than once is a great advantage to this kind of study, and program repetition an important component of home-based instructional TV systems. In spite of this experience, however, other pressures for the use of the limited broadcast time have preempted *Telekolleg* from Channel I and it is currently seen only on Channel III.

Flexibility

A characteristic of *Telekolleg,* considered significant by its administrators, is its flexibility and adaptability to changing needs in education. Conventional schools, in Bavaria as anywhere else, respond very slowly to new findings in learning psychology, teaching methods, or the need to alter curriculum. New TV lessons, for example, can be prepared far sooner than classroom teachers can be retrained, since only a few experts are needed for lesson planning and development. The constant ongoing research and evaluation that is an important part of *Telekolleg* ensures continual feedback of information on the effectiveness of the materials and their relevance to the needs of the participants. "Nowhere else in the whole field of education," writes Dr. Walter Fuchs, *Telekolleg* Director, "can the obsolete be so quickly thrown overboard, the latest findings of educational psychology or new subject matter be so readily incorporated than in this multi-media system" [9, p. 9].

If this is true, it could be significant. Changes in method, techniques of presentation, student response, and the like, being entirely the responsibility of the broadcasters, would undoubtedly lend themselves to prompt revision whenever indicated. The fact that the standard *Berufsaufbauschule* curriculum is followed, however, would seem to indicate the West German Ministry of Education would need to ratify any subject-matter changes, and this might tie up the process in some of the red tape that slows changes in the schools.

TELEKOLLEG II

As a result of the success of *Telekolleg* I, *Telekolleg* II is now in the production phase. This second *Telekolleg* has a different purpose, because its curriculum, when successfully completed, leads to the *Abitur* exam, which qualifies the student for entrance into a university (see Fig. 6 above). The *Telekolleg II* curriculum is thus essentially that of the higher levels of *Gymnasium*, corresponding roughly to the junior college in America. It allows the academic student a second educational path by which to reach the university.

ANNOTATED LIST OF REFERENCES

1. Erikson, Clifford G., and H. M. Chausow, *Chicago's TV College: Final Report of a Three Year Experiment,* Chicago City Junior College, Chicago, August 1960, 98 pp.
2. Erickson, Clifford G., H. M. Chausow, and James G. Zigerell, *Eight Years of TV College: A Fourth Report,* Chicago City Junior College, Chicago, September 1964, 40 pp.
   (The latest full report from *TV College.* Now in preparation is a report covering operations from 1956 through 1973.)
3. Chausow, Hymen M., *TV College: 1956-1966,* Chicago City College, Chicago, March 1967, 6 pp.
4. McCombs, Maxwell, "Chicago's Television College," *New Educational Media in Action: Case Studies for Planners—II,* UNESCO. International Institute for Educational Planning, New York, 1967, pp. 101-127.
5. *Multi Media Systems in Adult Education. Twelve Project Descriptions in Nine Countries,* Internationales Zentralinstitut für Jugend- und Bildungsfernsehen, 8 München 2, Rundfunkplatz 1 (International Institute for Youth and Educational Television, 8 Munich 2, Networkplace 1), 1971, 255 pp.
   (An excellent compendium in English containing descriptive and evaluative data about specifically home-based instructional systems using television or radio as one of their components. *Telekolleg,* pp. 39-59; Chicago *TV College,* pp. 221-236. A set of 5 foldout charts compares the 12 systems in 30 different respects. Invaluable for planners of home-based instructional systems.)
6. Schardt, Alois, Hans Schiefele, and A. O. Schorb, *Telekolleg im Studienprogramm des Bayerischen Rundfunks. Wissenschaftliche Begleit-untersuchung,* Heft I *(Telekolleg* in the Education Program of the Bavarian Broadcasting System. Scientific Accompanying Investigation, Vol. I), Munich, 1970, 118 pp.
   (Source book for evaluation data. In German, with summaries translated in English, Spanish, French, and Russian. Contains all published data, detailed charts and statistical presentations, as well as evaluative comments by the researchers.)
7. Schardt, Alois, Hans Schiefele, and A. O. Schorb, *Telekolleg im Studienprogramm des Bayerischen Rundfunks. Wissenschaftliche Begleit-untersuchung,*

Heft II (*Telekolleg* in the Education Program of the Bavarian Broadcasting System. Scientific Accompanying Investigation, Vol. II), Munich, 1970, 146 pp.
(Translated summaries of the text of Volume I.)

8. Schardt, Alois, Hans Schiefele, and A. O. Schorb, *Telekolleg im Studienprogramm des Bayerischen Rundfunks. Wissenschaftliche Begleit-untersuchung.* Heft III (*Telekolleg* in the Education Program of the Bavarian Broadcasting System. Scientific Accompanying Investigation, Vol. III), Munich, 1970, 119 pp.
9. Fuchs, Walter R., *Telekolleg, A Multi-Media Instructional System,* Bayerischer Rundfunk Studienprogramm (Bavarian Broadcasting System Education Program), Munich, no date, 10 pp.
(A fine summary and presentation of the highlights of the *Telekolleg* program. Contains an excellent three pages on the national need that *Telekolleg* was designed to help fulfill. Also available as two-page summary.)
10. *Multi Media Systems,* Internationales Zentralinstitut für Jugend- und Bildungsfernsehen, 8 München 2 (International Institute for Youth and Educational Television, 8 Munich 2), Networkplace 1, 1971.
(A 20-30 minute film showing excerpts from some of the *Telekolleg* programs and outlining the progress of the project.)
11. *Newsletter,* Children's Television Workshop, New York, New York, January 29, 1969 to May 24, 1972.
(An occasional periodical containing news of progress in staff formation, research, production, and the like.)
12. Cooney, Joan G., *Television for Preschool Children, A Proposal,* Children's Television Workshop, National Educational Television, New York, February 19, 1968, 55 pp.
(A proposal for research and/or related activities submitted to the U.S. Commissioner of Education for support through authorization of the Bureau of Research submitted by the Children's Workshop, National Educational Television (NET), John F. White, President. This proposal requested and was granted $4,000,000 for the development and production of *Sesame Street,* June 1, 1968 to June 1, 1970.
13. Ball, Samuel, and Gerry A. Bogatz, *A Summary of the Major Findings in "The First Year of Sesame Street: An Evaluation,"* Educational Testing Service, Princeton, New Jersey, October 1970.
14. Cooney, Joan G., *The Potential Uses of Television in Preschool Education,* A Report to Carnegie Corporation of New York, New York, no date, 52 pp.
15. *Statement of Instructional Goals for the 1970-71 Experimental Season of "Sesame Street,"* Children's Television Workshop, National Educational Television, New York, 1969, 8 pp.